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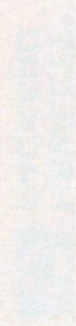
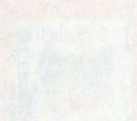
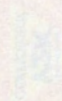
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MARCH 2000

# MacAddict

43

## highlights

### 27 Apple's Revolutionary New OS

At Macworld Expo, Apple revealed the look and feel of its forthcoming Mac OS X (hope you were taking notes, Microsoft). Accompany us as we take a look at the gadgets and widgets that make up this revolutionary change to the Mac OS—all in living color! (But you'd better like Aqua, 'cause that's the only color this OS comes in.)

BY DAVID REYNOLDS AND IAN SAMMIS

### 32 20 20-Minute Mac Projects

Time is a terrible thing to waste. So rather than watch yet another rerun of *Mash*, sit down at your Mac and try one of these nifty 20-minute projects. From setting up a Web cam to making a digital slide show, you'll be on your way to a more productive life in no time.

BY KEVIN SAVETZ

### 40 20 Toys for Techies

He blinded me with science, doo doo doo—Ian Sammis does his best to damage your ocular nerves with these 20 very cool—and sometimes very geeky—toys for techies. Whether you want to visualize electron orbitals in pulsing colors or play oil seeker with Seismic Duck—it's all here! BY IAN SAMMIS

## how to

### 64 Use a Bézier Pen Tool

Real artists make the pen tool look easy, but for the rest of us it's like trying to stuff a large cat into a small box—bits keep popping out. Learn to get that ornery tool under control.

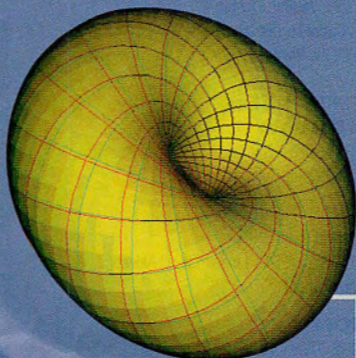
BY ELYSE CHAPMAN

### 68 Use Your Mac to Sing on Key

Not all of us sing like doves. Mostly we sound a bit more like demented crows, our notes falling somewhere along one of the lesser-used scales mentioned in the appendix of a music theory text. We'll show you how to at least get your squawking on key. BY ANDREW TOKUDA

### 72 Use Word's Style Sheets

Yeah, yeah, we know—you bought the vastly powerful Word 98, but you hardly use any features SimpleText hasn't provided for the last five years. We'll show you how to get started with some of Word's more powerful features. BY MARIA LANGER



MMM...doughnut!



DEAR GRANDMA, did you know I can lick my Eyeball?



TWO OF MY ARMS have stopped! Stoke the fire!



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can pull some  
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# every month

## 12 Editor's Note

I am *not* Jeff Daniels!

## 14 Letters

Aw, come on, now...that's just silly!

## 18 Get Info

The Internet does strange things to companies—Apple just got a little wacky, but MetaCreations shattered. We wander about with our wayward iBook, check out the latest industry lawsuit, and chat with musician and Mac user Ice-T.

## 24 Scrapbook

Sometimes the best toys we get around here aren't Mac hardware or software—they're the branded trinkets hopeful companies send us. Here's a look at some of our favorites.

## 46 Reviews

Holy velocity engine, it's the G4! Kill with skill when you play Total Annihilation, Descent 3, and Rainbow Six. Reign in Mac football with Madden NFL 2000. Cubase VST/24 4.1 converts at least one digital musician, plus we scrutinize Canvas 7, Sorenson Video 2.1 Developer Edition, the Epson Perfection 1200U, and other tools.

## 62 PowerPlay

Star Wars Episode I Racer is far from the lame game we thought it would be. In fact, we're burning a lot of time racing around Tatooine. Get the lowdown on the hottest—er, the only racing game to hit the Mac in a long time. Plus, we take a look at possibly the worst game ever made for the Mac.

## 76 Ask Us

There's only one z in Buz, folks, and that's for Knowz-it-all. This month Buz has tips on Internet speed, locked files, and networking your home printer.

## 104 Shutdown

It's the funniest thing you've seen since Uncle Bill choked on that turkey bone. Oh, wait...that was pretty funny. Still, this is worth a look.

# MacAddict

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C'MON, GUYS,  
I'm still waiting  
for my peanuts!

Great job, Niko, Rich, Sharon, and Sherri.  
Welcome aboard, Cathy and Anna! (Gotta  
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# the disc



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## highlights

### Mixman Studio 1.0 Demo Featuring Ice-T and Smash Mouth

Music fans, now's your chance to get in on something new. Mixman Studio puts you in the record producer's seat and lets you take an artist's individual music tracks, known as D-Plates, and mix the song any way you want—in real time. We're giving you Ice-T's *Always Wanted to Be a Ho* and Smash Mouth's *All Star* to play with. Musicians, wanna jam with these guys? Then head into Mixman's virtual recording studio, cut your own music tracks, and put yourself in the mix. Be the envy of all your friends—we won't tell 'em the truth!

### Star Wars Episode I: Racer 1.0 Demo

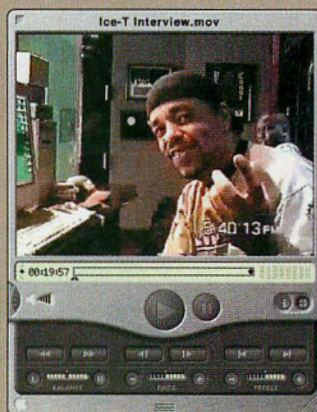
What are we all doing these days? Playing Racer! Oh yeah, and putting out this magazine. But back to Racer—this completely addictive racing game puts you in control of your own turbo-charged pod, blasting through gorgeous scenery as you dizzy it up with the competition in a flight to the finish. This demo will have you careening through Tatooine at 700 mph. Whoops, there goes my engine—and my lunch.

### Dreamweaver 3 Trial

Oh, what a tangled Web inexperienced HTML programmers weave! Here's a cool tool that will help you set up your Web pages and sites in any browser. Lay out your pages visually without sacrificing HTML control, and present the public with a professional, dynamic Internet experience. Dreamweaver also piggybacks nicely on Fireworks 3 (find this trial on The Disc, too!) to create completely interactive, easy-to-maintain Web sites.

### Quake III: Arena 1.0 Demo

If you haven't already heard about this one, what rock have you been hiding under? Released a while back as a public beta for the Mac community only (take that, you pee-see prima donnas), the Quake III final candidate is now official. Stockpile your weaponry and get ready to exercise your digits as you run, jump, and fly through the air in full assault mode. It's a bathed-in-blood, brutal battle in this realistically rendered 3D world of chaos and mayhem.



Rob and Kris had the opportunity to meet the Original Gangster—and Mac advocate—Ice-T in his home in LA to talk about Macs in the recording studio, the future of digital audio, and the music industry—and you'll find it in this month's video. We *love* the stuff we had to edit out—but hey, we don't want to stir up *too* much controversy. Oversensitive viewers may still want to proceed with caution.



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# editor's note

I wish you people would stop laughing at me.

**A**t the Macworld Expo in January, an Apple employee handed me one of the newly designed Apple business cards, and in addition to the new fruity logo, I also happened to notice that Apple officially dropped the word "Computer" from the title of the company. It's now just plain ol' Apple—a very small detail, but it made me stop and think.

I noticed the shift in the official company moniker the same day Steve Jobs took the stage at Macworld Expo and demonstrated Apple's new Internet strategy—including iTools, iReviews, iCards, and a very Microsoftian partnership with Earthlink (I can already hear Jobs calling it his ISP of choice). When showcasing the new Apple Web site updates Steve talked about going "beyond the box." Apple, it seems, is looking to become something besides just a computer company.

Of course this didn't suddenly happen in January. Steve has repeatedly said that he wants Apple to be the Sony of computer companies. Sony, remember, makes a wide variety of products from Walkmans to computers, all of which somehow maintain the Sony style and quality. Changing Apple's name is one subtle step toward Apple actually becoming more like Sony. It's probably a bigger move than the entire Internet strategy the company unveiled in January—at least I hope so, because the Internet stuff is pretty weak. The worst offender of the lot, of course, is KidSafe, Apple's ill-fated foray into censorship. I'm all for keeping kids away from porn, but it's a tricky thing for any company to take on, and so far, Apple isn't doing it right at all (see *Get Info*, this issue, p18).

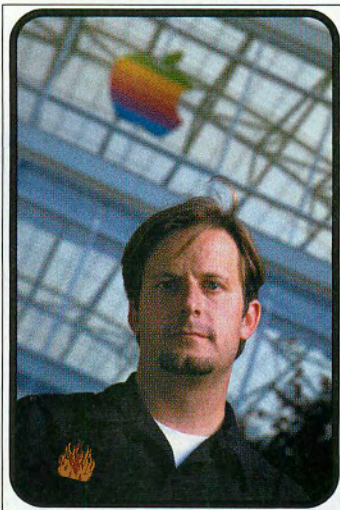
It is important, though, that a broadened Apple will begin to interweave Internet technologies with its operating system to create some very unique tools and toys for its customers. It's this idea that really justifies dropping Computer from the name. Only a company that produces hardware and software, and delivers Web services could pull it off.

I wouldn't be surprised to see the new Apple finally deliver that hand-held device, or bring some really startling innovation through its unification of the OS, the Web, QuickTime and the Apple site stuff in the near future. But I monitor Apple's change with a touch of trepidation as well. I just hope that by broadening its scope, Apple doesn't forget about what makes the company great—the Mac.

## Staff Shifting

In our never-ending quest to keep you on your toes, we brought on a new features editor this month by the name of Cathy Lu. Cathy did a stint at *Mac Home* and *Imagine's Next Generation* before joining the *MacAddict* team. Look for her Staff Video debut in upcoming months.

Also, next month will be the last for our beloved Disc Editor Kris Fong. She's heading over to join Nikki Echler on *Imagine's* new digital photography magazine, *digitalFoto*. She's done a terrific job of shaping our Disc over the last year, and she'll be missed.



CALM, SEMI-COOL and collected.

## Staff Rants

**T**hese people are plotting against me, I know it. Here's what they're scheming this month.



Cathy Lu

Features Editor, *New Kid on the Block*

**Q. What Else Should OS X Have?**

**A.** The ability to do my taxes, balance my checkbook, and write my copy.

**Q. What is Your Favorite iTool?**

**A.** I like HomePage because there aren't enough personal home pages, fan sites and odes to Britney Spears on the Web already.



David Reynolds

Executive Marathon Runner

**Q. What Else Should OS X Have?**

**A.** The ability to resize all icons to a less insane size would be great. I mean, c'mon—128 by 128? Jeez.

**Q. What is Your Favorite iTool?**

**A.** The screwdriver...no, wait! The hammer. But the iDisk is pretty cool, too.



Kris Fong

aka Batgirl

**Q. What Else Should OS X Have?**

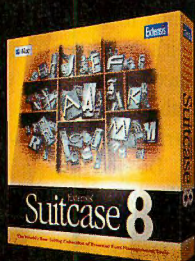
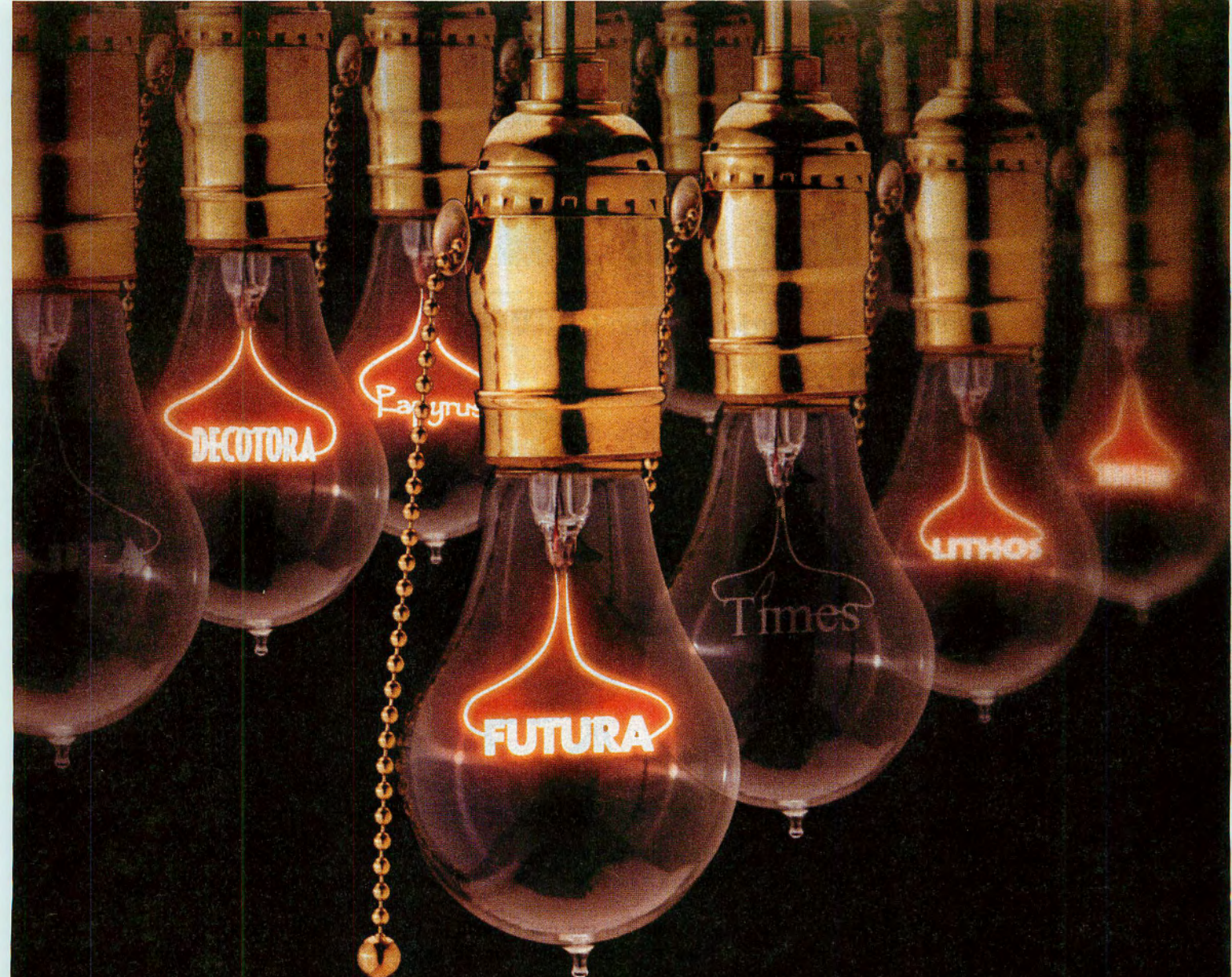
**A.** Support for third-party FireWire audio peripherals. The ability to turn the Finder back to the original format (for those who'll miss their desktop pet hard drive icon), and Apple should adopt Ambrosia's marketing campaign—have Steve Jobs eat a real bug for every software bug reported in OS X!

**Q. What is Your Favorite iTool?**

**A.** Since I refuse to upgrade to OS 9, I can't access iTools. So a "wrench" is a good thing to throw in this scenario...

I just hope that Apple doesn't forget about what makes the company great—the Mac





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OS 7.5. 5- 9.0.

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SUMANA021299





# letters

Write on, you hard-core Mac fans! We can take it.

## This Month

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**FOR CD PROBLEMS:** Go to <http://support.imaginemediacom.com>.  
**FOR SUBSCRIPTION QUERIES:** Call (toll-free) 888-771-6222.



**GET ON, GET ACTIVE.**  
Talk to us and other Mac addicts at the Web site.

## FRAGNABIT!

I was enjoying the January 2000 issue of *MacAddict* when I noticed the picture from Unreal Tournament on page 10. You say, "Without a target, this rocket will launch to infinity and beyond!"

Well, that's not the rocket launcher you're holding. The weapon you're holding is the ASMD Shockrifle. Just thought you'd like to know that. No harm done. I don't think anyone else actually looked at the picture as closely as I did.—KYLE DUREN

## WE WANT SIM FLYING HEAD

I'm rather disappointed by Sierra's foolish and shortsighted decision to yank Half-Life. Boy, that company has some geniuses up in marketing! If they studied the Mac gaming market a little more closely, they would quickly find out why Caesar and Civilization bombed.

Take a look at what games sell on the Mac—Unreal, Marathon, Myth, Warcraft. They're all action games! Yes, some have a dash of strategy, but games like Civ will never (I believe) do well in the Mac market. They get great reviews from those who actually sit down and learn to play them, but the general Mac public (who haven't really seen a whole lot of this stuff before as the PC people have) will say, "Where are the flying heads? Looks boring to me," and not buy it.—DAVID KARL

## SHOULD BE READY BY THE TIME YOU READ THIS

You guys are worse than losers; you are lying losers. You got me all excited about



**MARKETING GUY SAYS** Unreal Scrabble Arena II is gonna be a cash-cow! Trust me!

the iBorg and said that it would be finished and I could pilot it "by the time I read this."

So here I am, all excited about the rebirth of the Mac as a system controller, but when I scour your site there is not even a mention of the iBorg.

Let me know when you guys stop lying and I can really come and visit the iBorg. Don't bother letting me know when you stop *losing*, because it'll never happen. Humpfff!—PAUL BRUNEMEIER

## LIKE THE FLU

Well, Mac OS X Client is just months away (knock on wood), and you guys are probably thinking of a punny headline to put on your cover. Well, have no fear, I've done the thinking for you: "X Sells!" Catchy, eh?

—SIMON YIU TSUNG WONG

## WHOA...HEAVY

In your investigation of StarPlay's claim of Ten Tons of Fun, I believe you forgot to calculate the entertainment value of opening the read-me files with the monitor turned off, listening to the text via Speech, and

guessing which game it's talking about. I would estimate each read-me file is worth at least 15 metric pounds. This is still well under the ten tons StarPlay claims, but it's closer.—MARK KIBBEY

## LIGHTEN UP

I was going through my January *MacAddict* when I noticed the "Mac to the Future" article (p28). Just at the beginning, to my surprise, I spotted an error in the "Travel Near Light Speed" section on page 29. You said, "Think about that next time someone tells you we'll never break the 186,000-mph mark." Einstein didn't say that the speed of light was 186,000 miles per hour—he said it was 186,000 miles per *second*.

I really believe that for changing what Einstein said, you should fire Mark Simmons, or at least give him a good smack in the pants.—ZACH KOPPERS

Well, now you have done it. Officially, the old speed of light was 186,000 miles per second. However, you have just changed it to 186,000 miles per hour. Now we know what happened to the last Mars Lander. It's not lost—it's just been detained for breaking the speed limit. Have you guys informed NASA about the change?

Mark, that's miles *per second*, not per hour. Do you live in a slow-mo world? Actually, you must have known that, because 4 billionths of the distance light travels in one second is 2.8512 inches. So I guess that was just a typo. Darn, I thought I might win that G4 for outsmarting the author.—JOE DEMUTH

## WHO THE HECK IS JAIL-GUY?

I was messing around on my old Mac SE, and I went to About The Finder to see the monochrome image of Silicon Valley. I



noticed a name under the picture—Steve Capps. Is this person any relation to the Jail-Guy?—QUEST200SF

## AY, CARAMBA!

Ever try to use Apple's Spanish Text To Speech voices (only available in the Apple CD Extras folder on the Mac OS CD-ROM) to speak English instead of Spanish? I've been dying of laughter all weekend!  
—DYLAN DRAZEN

## ALL MY BROTHERS, SISTERS, AND ME?

I'd like to sing a little sing-along song today about Macs.

Macs are cool  
They don't drool  
PCs suck  
They are bad luck  
So buy a Mac  
Or I will sack  
Your family!

—ANDREW MODLIN

## THAT'S SPECTICIOUS OF YOU!

Regarding Anderson's letter in your last issue, I know the definition of the adjective *cromulent*. It means:

1. Having the quality of being crummy.
2. Coated or sprinkled with crumbs, especially of starch-containing food.

As you can see, *crumb* and *cromulent* do sound vaguely similar. The first definition does not seem quite accurate in regard to your magazine. When I thought of the second definition, however, I remembered a letter way back where someone said his *MacAddict* was covered in crumbs. Quite a coincidence.—BENJAMIN NUSHMUTT

## DON'T YOU MEAN PERSIMMON?

I'm writing this for many reasons, but only one comes to mind right now—the color orange.

The past few issues of *MacAddict* have discussed many orange-colored items, including the tangerine iBook and Cheez-Its. As for the tangerine iBook, many people refer to it as orange, but when the word *orange* appeared on your magazine cover (Oct/99), I noticed a number of letters addressing that "error" in subsequent issues. My opinion: Apple should have saved itself the trouble and called the tangerine iMac *orange*. After all, an orange is also a fruit.

Now, about the letter regarding Cheez-Its in your January 2000 issue—how

dare Mark Kibbey insult Cheez-Its! Cheez-Its are great! Goldfish are good, too. It's fun to bite them in half. But that's sort of beside the point.

Well, I guess that's about all I have to say regarding iBooks and Cheez-Its.  
—GREG ANDERSON

## LIKE IT'S STILL 1999

I'm in high school now and have to make an important decision—what to do with my life.

I have decided to either become an actor or work at *MacAddict* as a writer. But if I choose one, I'll miss out on the good stuff that goes with the other. Here's the dilemma that faces me.

If I become an actor:

I can become famous.  
I can have a lot of fun making movies.  
I can have fun going to cast parties.

If I work at *MacAddict*:

I can become famous.  
I can have a lot of fun making movies.  
I can have fun getting paid to work with Macs.

So my question is, do you have parties?

—STEPHEN B. SWIFT

## NEXT YEAR'S MODEL IS MADE OF TRANSLUCENT PLASTIC

The boys (and a few girls—let's be fair) can have Kris Fong. Gimme Rob "Prison Guy" Capps any day! Prison Guy is to *MacAddict* what the iMac was to Apple: a big, huge, and desperately needed dose of sex appeal. Now don't bother me while I assemble my Rob Capps Desktop Picture. Yowza.—CECILY WALKER

## NO, IT JUST MEANS YOU'RE WEIRD

I don't know if this qualifies or not, but are you a Mac addict if you pry the logo off a Quadra 800 tower and epoxy a stud onto it just to make an earring?—BRUCE HALMO

## CURSES, YOU MEDDLING KIDS!

You may be interested to know that I have foiled your diabolical plans to hide the cool audio tracks on The Disc!

Using an ingenious combination of ResEdit (to view invisible files) and TechTool Pro 2 (to recover them), I am listening to all four tracks over and over and over again in QuickTime Player!

Nice try, *MacAddict*. Until next time... mua-ha-ha-ha-ha-haaaaah!

—ADAM BARISOFF

## REAL MAC ADDICTS DON'T HAVE FRIENDS

Don't get me wrong, I love your magazine. But I'm a little confused about one thing. You constantly refer to "our peecce friends." I thought real Mac addicts didn't *have* peecce friends.—JOE CRONIN

## Um...No

Is Dave getting in touch with the young Steve Jobs within him? I was taking a look at some old staff videos and his hair is a lot longer now. When you look at how it's styled, it reminds me of Steve Jobs's hair style in college (at least, the image of Steve Jobs in college that TNT provided me with over the summer). What does this new look mean? Is Ian the Woz to Dave's Jobs? Does the iBorg secretly double as a Blue Box? How long until they bring us a



By the look on your face, I can tell you are a Windows™ user. So I thought I would explain a few things about Macintosh™. 1) I am here to serve you and want you to be productive. 2) I will not assume I know more about what you want to do than you do. 3) Once you've used a Mac™, going back to a PC is like moving back in with your parents. Enjoy the freedom.

OK

r. glower

YOU'VE PROBABLY NEVER SEEN THIS dialog box because you're a Mac user.



completely revolutionary computer? Can I get a job in their new computer company, which they'll run out of Ian's garage? Where do I sign up to buy stock? Oh, and who are the evil enemies, those narks from Maximum PC? —JONATHAN CLAYDON

## KEEP GUESSING

I'm sure you knew that Gil Amelio's user password, published on page 90 of the January 2000 issue, would generate a pile of mail. So what was it? Hmmm...eight characters...so many possibilities: hatejobs? 2tuff4me?

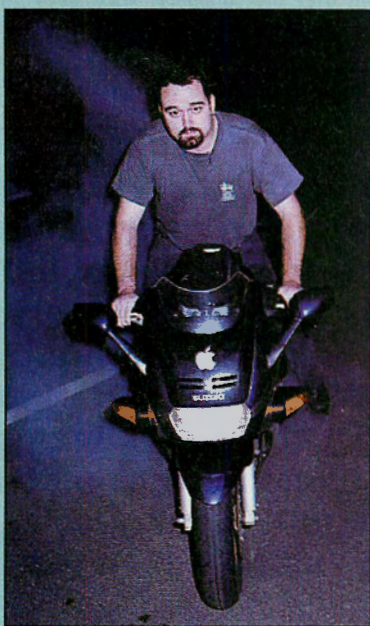
I have to know. Tell me, pretty please, please, please. —JOHN LANGLOIS

## DALI WOULD BE PROUD

I was taking a Photoshop class last semester. Unfortunately, for some odd reason we were using NT computers in class. Luckily for me, we could take the work home, so instead of using those cold, slow machines I was able to do the work on my 266Mhz beige G3. When informing the teacher that I had a Mac, her first response was to say "Oh, I'm sorry," in a joking manner. I took

## RECENTLY SIGHTED

**S**ince at least \$50 worth of tires went up in smoke just to provide you with a cool pic, could I have a T-shirt or something? Maybe a tangerine iBook? —BRENT CANTRELL



Proof that the G3 "smokes" the Intel processor.



**TITLED "CAN I HAVE A GOLDFISH NOW?",** this work represents the absolute supremacy of the Mac...really.

like Prison Guy's inaugural editor's rant, which was excellent propaganda (brought a nationalistic tear to my eye). I mean attitude like "I'm going to burn this Wintel box and roast marshmallows over it."

—AARON HEE-STACPOOLE

## ACTUALLY, THEY'RE COASTERS

Since I got my G4 and its USB keyboard, I cannot help but complain about the missing end key. I think Apple should trash the help key and put in an end key. The only time I actually use the help key is when I press it accidentally.

P.S. Stop sending shiny silver frisbees with every issue. They don't fly well.

—BEN ULLIAN

## CONSIDER HIM SHUT

In the *Letters* section a couple of months ago, I read a letter about no grape iBook. Then I read about a new graphite iMac. *Dub!* Apple is saving the other colors (strawberry, lime, and tangerine) for the G4 iBook. Well, maybe not, but if it'll make what's-his-name shuddup, then that's good enough for me. —RUBYTUES

## GO AHEAD

We are an alternative rock band that wishes to play at the Apple campus. The band's name is Tenpennydime.

P.S. We are a good band, so you don't need to worry. —JASON

## OK, It's Two Now

Hey there! It's been a while since I've written to you guys (and since you guys have published many of my letters—a whopping *one* "You Know You're a Mac Addict When..." joke in the Dec/98 issue), but I'd just like to address a few things.

1) Thank you *sooo* much for putting a Photoshop tryout on The Disc in January. I have seen all of these cool-looking Photoshop how-tos and tutorials throughout my *MacAddict* collection, but I'm not about to spend \$500 on a program that I'm only going to use to waste my time drawing with. I'd rather have that stuff either for free or relatively cheap.

2) Regarding the iBorg: Ian, Dave, how 'bout you take that brand-new ViaVoice

it as a challenge. From then I stuck some sort of Apple reference into every assignment she gave me. I am sending you this picture, "Can I have a Goldfish Now?", the project I submitted for my final in the class. The saying is from *Poltergeist*, when Drew Barrymore decides she should get a new pet after hers dies. In this case, the dead pet is represented as those damn slow PCs in class, and the reward would be receiving a Mac to work on instead. By the way, I did get an A on every assignment I turned in, including this one. —JEFF

## ALSO SWIMMING WITH THE FISHES...

Where's Max? He's disappeared! Someone call a private eye and find him! No seriously, where *did* Max go? He wasn't on the cover of the January issue, much to my dismay. If you have decided that he was stealing the show, or not an option, or whatever reason you had for getting rid of him, please tell us readers about it. If you didn't get rid of him, and this was just a mistake, please get Max back ASAP.

—PETER NIX, 14-YEAR-OLD MAC ADDICT

## PUNKER THAN US

The feel of The Mag is different. Yeah, sure, new logo, but that's not it.

No more biting editorials, if there ever were any—well, forget it, but it's the feel that counts, and the "new" *MacAddict* feels like a watered-down *Macworld* clone. Yes, that's scary, and I'm almost sorry I said it, but it needed pointing out. I know, I'm selfish, but I'm the reader (maniacal laughter). Maybe it's the 13 advertisements in the first 27 pages of the January issue.

What I guess I'm asking for is more attitude, please. And I don't mean attitude



## YOU KNOW YOU'RE A MAC ADDICT WHEN...

...you argue that although your next coffeemaker will probably be USB, the blender has to be FireWire (you know...for frappés).—DAVE FINK

...you're typing a research paper on Microsoft Word, and you suddenly find yourself struggling to resist the urge to plagiarize.—PABLO TORRE

...you work in technical support and you can identify a Mac by its startup chime (I'm right 90 percent of the time).—CECILY WALKER

....you buy one of every iMac ever made...including the PC clones!—DAVID ORR

...your art teacher asks you to make a colorful sculpture, and you immediately ask for translucent clay.—JONATHAN BELL

...you realize that you love your wife even more because she was born on the exact same day as Steve Jobs!—GENE MELCHIONNE

...you identify your friends and coworkers by the flavor of their iMacs.—JOE RAVESLOOT

... you put jam on one piece of bread with one hand and peanut butter on another piece of bread with the other hand and call it "multithreading."—SAM MARTIN

...you only wear grape-colored clothing to match your iMac.—ELISABETH RYDBERG

Millennium program to the Eliza virtual therapist and have *that* roaming through the halls of PC Accelerator? Or, better yet, use T. Bender's other creation, called Azile (Eliza with an attitude). That way, if they start bad-mouthing the Mac, Azile will come back with some darn good, uh, comebacks. Or if you're feeling *really* evil, hack away at Azile's STR# resources and put in your own responses! Or add some

more! The possibilities are endless! Bwahahahahaha!

3) Could we have an issue devoted *entirely* to old Mac games and vintage Mac software? I'd love to see more screenshots of the earliest systems and read about the classics like Dark Castle and Enchanted Scepters (remember those?). Then you can absolutely cram The Disc with all the games mentioned, plus maybe a copy of vMac so

that owners of the new G4s can enjoy them too. Heck, we had an issue about new games—now how about some old ones?

Oh, and by the way, Jeff Daniels—oh, I mean Rob Capps—nice new look in the January *Editor's Note*.—KEITH KAISERSHOT  
1) *You're welcome.* 2) *They sure are.* 3) *No. Finally, thanks.*—Ed.

## A BETTER EGO BOOST

I was looking through the January 2000 issue of *MacAddict*, looked over the cover and all that good stuff. So I look up at the top and notice you changed your slogan. And for some reason it seems like you guys are trying to insult yourselves with it. It used to be "A better machine. A better magazine." Now it's "A better machine. A better logo." What the heck? Don't you guys think it's a better magazine anymore? Well, it is! —DANIEL DE LA TORRE

## IF YOU DON'T READ IT, HOW DO YOU KNOW IT'S FINE?

Although I do not personally read your fine publication, I happened to see a letter by Mr. Ahlgren, who presumes to be in the know as to how Mr. Jobs of Apple Computer manages his presentations. I do not recall ever meeting Mr. Ahlgren.

Mr. Ahlgren may be enlightened as to how some organizations may manage their keynotes and presentations, but he is clearly uninformed regarding Mr. Jobs and Apple. I would suggest that Mr. Ahlgren reserve his editorial effort for something he is sure about.—STEPHAN ADAMS, EXECUTIVE PRODUCER TO MR. JOBS, ADAMS & ASSOCIATES

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Think network. Think nightmare.  
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## Postcards from the Expo

### *Jobs Stumbles with Apple's new "Internet Strategy"*

It's almost never a good sign when a computer industry giant announces an "Internet strategy" or a decision to "focus on e-commerce." This sort of announcement seems to be roughly equivalent to invading Russia in the winter—it always *seems* like a good idea, but it usually leaves you looking somewhat ridiculous.

As best, iStrategies are marginally useful, as with Metrowerks's decision to start hosting Internet courses on programming (<http://www.codewarrioru.com>). At worst, they tear into a company's existing base, leaving customers and employees alike confused and angry. (The recent slashing at MetaCreations, which has cost 100 of its 230 employees their jobs and terrified loyal customers is a painful example.) Fortunately for us all, Apple's new Internet strategy is much closer to the former—the worst parts will simply become irrelevant, while the best have some chance of eventually being useful.

### Record Sales

Steve Jobs, Apple's now-permanent CEO, announced Apple's new strategy to an enthusiastic crowd during his keynote address at January's Macworld Expo. Before describing the new Internet strategy, Jobs spent a short time crowing over the previous quarter's sales. Although full results weren't in (and won't be until after we go to press—we'll bring you full coverage of Apple's Q1 financial results next month), Apple revealed that they'd sold over 1.35 million Macs during last quarter. That's a new record for them—almost twice its average rate of computer sales in 1998. Jobs also announced that a significant fraction (38%) of new iBook users were new to the Mac platform, with more than half of those from the Wintel side. He also announced that QuickTime has now more than paid for itself: The \$12.5 million investment in Akamai (<http://www.akamai.com>) that we reported on four

This iCard has been sent to you from Steve Jobs



Please check out  
iCards, iReview and  
iTools - our new free  
services for Mac  
users at  
[www.apple.com](http://www.apple.com)

Best,  
Steve

**STEVE SENT US AN ICARD! We feel so special.**

months ago (*Get Info*, Nov/99, p20) has increased its value to over \$1 billion.

### Apple's Internet Potpourri

To be fair, Jobs would have had difficulty meeting the crowd's expectations with anything other than an announcement of new hardware. Since the introduction of the iMac in May of 1998, nearly every major speech by Jobs has served to unveil a new type of Mac. Somehow, new Internet-related gadgets didn't quite compare.

Still, even Jobs's legendary Reality Distortion Field couldn't hide the banality of Apple's new Internet strategy. The crowd grew increasingly restive as Jobs discussed, in his usual glowing terms, Apple's new plan to review Web sites (iReviews) and its new Internet greeting card service (iCards). The latter announcement provided a great deal of unintentional humor as the newly unveiled site repeatedly kicked Jobs off for inactivity.

Things got slightly more interesting as Jobs moved on to iTools, a series of new Internet-related tools which lets OS 9 users take advantage of Apple's servers to add new capabilities. Jobs introduced four iTools: KidSafe, Mac.com, iDisk, and HomePage.

KidSafe, the first iTool Jobs demonstrated, is an Internet filter that works in a manner precisely opposite to most filter tools. Instead of maintaining a list of "unsafe" sites, KidSafe checks servers to see if a site has been declared safe by "certified teachers and librarians." We can't help but approve of this system—just after launch, Macaddict.com was KidSafe, while both Macworld.com and Machome.com were blocked. Most other major corporate sites were also blocked—so if you're determined to save your children from the ravages of *Newsweek*, Hasbro, ABC, NBC, CBS, the WB, and most of the rest of human existence, KidSafe may be right up your alley.

Apple is now providing new email addresses to Mac users at the domain Mac.com. Email addresses are first-come, first-serve, so the *MacAddict* editorial staff would like to apologize to all the Irving Sammis, Donald Reynolds, and others out there whose preferred email addresses may already be gone. We're apparently not alone in this game—Jobs cheerfully pointed to the inaccessibility of "steve@mac.com" as he introduced the service.



# Interview with an Original Macsta

*Ice-T on Macs, MP3s, and the music industry.*

With iDisk, Jobs introduced the one genuinely useful component of Apple's new strategy. iDisk provides a 20MB AppleShare-over-IP volume to any Mac user who wants one. This provides Mac users with an easy way to shuffle data from one machine to another, without the reliability problems presented by magnetic disks. Since one folder on each iDisk is "public," (other users can access it), the iDisk also provides an extremely friendly way for a company to provide a smallish download, without any need for the usual binhexing.

As a grand finale, Jobs announced HomePage, a tool which allows you to create a simple Web site based on the contents of your iDisk. He demonstrated the creation of a photo gallery and an "iMovie theater." During this demonstration, a rather alarming bug in iDisk appeared—Jobs's iDisk mysteriously vanished from his desktop, replaced by a second copy of Apple executive Phil Schiller's public folder.

## Getting the Cash

Since Apple offers all these features for free, it had to get a bit creative financially. Unlike many, many other companies, Apple at least had the good sense not to rely upon advertising revenue; instead, it made a vast (\$200 million) investment in EarthLink, apparently hoping that by making EarthLink the default ISP for new Macs, subsequent increases in EarthLink's stock price will reap earnings.

## Finale

At this point, nearly an hour into the keynote, the crowd was getting profoundly restless. Fortunately, Jobs had a few cards left to play. He introduced the new "Aqua" (that's "Acqua" to the *Wall Street Journal*) interface that Mac OS X will sport (see "Future Mac," this issue, p27). In addition, Jobs finally announced that he will continue his work at Apple as permanent CEO (or iCEO—he apparently still likes the moniker, even if the "i" no longer stands for anything in particular).

Now that the keynote is over, the judgement of the Mac community will begin. It will be interesting to see which parts of the Internet strategy survive and which fall into the overflowing junkheap to which Apple has consigned many previous "strategies." Will you be able to send an iCard in '01? Will KidSafe eventually lose its paranoia and become a useful tool? Only time will tell.—JS

**Y**ou might not peg a gangster-rap kingpin as a likely technological visionary, but rapper, actor, and music industry mogul Ice-T definitely is one. He was one of the first major artists to back the small and easily swappable MP3 music format publicly. He's among the foremost innovators of digital music and video Internet distribution with his Internet only music label Coroner Records (<http://www.coronerrecords.com>)—but be warned, this site is pretty rugged and not suitable

for children). What we like about him best, though, is that Ice-T (whom you might know from such rap hits as "Colors" and "OG" and from the movies *New Jack City* and *Breakin'*) is a Mac man.

Ice-T is such a Mac fan that he recently invited us to his estate high in the hills above Hollywood Boulevard in Los Angeles. He gave us a tour of his in-home recording studio (complete with a decked-out Power Macintosh 8500 used for audio recording postproduction), and philosophized about music, the Internet, and the record industry.

After talking with Ice-T in his impressive enclave, we realized that Ice's story echoes that of so many professional artists who love the Macintosh. He started his artistic endeavors on a Mac because it was the industry standard, and since he knows the OS, it's now the platform he prefers for computing.

Among Ice's current projects: The all-Internet Coroner record showcases up-and-coming artists'



**YOU AREN'T SEEING THINGS**—right next to Ice-T is the loaded 8500 that anchors his studio.

MP3s and QuickTime music videos (both free from the content restrictions that radio stations impose), and he has formed a relationship with Atomic Pop (<http://www.atomicpop.com>) for Internet distribution of his music via MP3 downloads or CD purchases. Ice is also working with Mixman Technologies' Mixman Studio (<http://www.mixman.com>), offering the software's users Ice-T songs broken down track by track—you can separate the drumbeat from the bass line, for example—and allowing fans to remix Ice's songs using Mixman.

His next plans include an online radio station, an online music video site, and a whole battery of other Internet-based ventures. As he puts it, "Anything you saw at one of those Webnoize Expos...we're doing all of it." As we said, though, the best part is that he calls Macs elegant and PCs "pieces of crap." You can check out everything Ice-T is doing by watching our exclusive video interview with him on The Disc.—RC



**FIND  
AN INTERVIEW  
with Ice-T on  
The Disc.**



# get info

get info

## Shareware Pick of the Month

### iDo Script Scheduler

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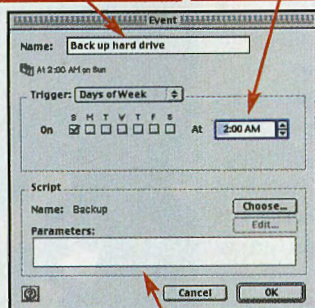
**URL:** [http://www.sophisticated.com](http://www.sophisticated.com/products/ido/ido_ss.html)

**REQUIREMENTS:** Mac OS 8 or higher

**F**inally, the Unix world's powerful cron (system timer) has made its way to the Mac as an easy-to-use utility. With iDo Script Scheduler from Sophisticated Circuits, you can set a time to run an AppleScript (or several scripts), even passing parameters to it if you so desire. The iDo utility works as a control panel, lurking behind the scenes until the time comes for it to fire off its scripts. When you upgrade iDo to the Enhanced version, you can schedule an unlimited number of events and access two new event types—hot keys (scripts that trigger when you press a key combination) and idle events (scripts that trigger when the machine isn't doing anything else). Here's a look at its interface.—*DR*

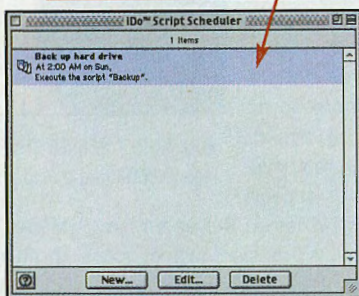
The name of the scheduled event

The time when the event will happen



The script that runs and the parameters that get passed to it

The main interface where you can add, edit, and delete events



**FIND**  
**IDO SCRIPT**  
**SCHEDULER on**  
**The Disc.**

## Lawsuit of the Month

*Online bookstore claims ownership of "one-click shopping"*

**Amazon.com**  
**V.**  
**Barnesandnoble.com**

**I**t's sad, but there have been enough industry lawsuits recently to warrant an ongoing report. The latest installment in the saga of the suits comes to us courtesy of Amazon.com, the always popular but never profitable online bookstore, with some help from those wacky folks in the U.S. Patent Office.

To get our little drama started, set the Way-Back Machine for September 28 of last year, when the Patent Office granted Amazon.com a patent on "one-click shopping," which lets a returning customer place additional orders with a single action. Meanwhile, Barnesandnoble

.com (the online subsidiary of Barnes and Noble) had created its own one-click shopping feature, apparently believing Amazon wouldn't get its patent—companies aren't supposed to be able to patent blindingly obvious ideas. With all the elements of the drama in place, Amazon.com filed suit on October 20, claiming violation of its patent.

The Patent Office has already come under fire for issuing absurdly broad patents in recent years, on items from online tournaments to information sales. Fortunately for Amazon.com, insanity appears to have triumphed once more; a U.S. District Court Judge issued a preliminary injunction against Barnesandnoble.com on December 1. We'll keep you informed as the lawsuit progresses.—*JS*

## New for the Mac

### Internet Explorer 5.0

Microsoft

<http://www.microsoft.com/mac>, Free

Those of you who don't insist on keeping your hard drive a Microsoft-free zone just have to try out Internet Explorer 5.0. With a new interface, an incredibly fast new rendering engine (code-named Tasman), better standards support, and a killer media bar, Internet Explorer 5.0 is the fastest, most elegant Web browser out there. It also conspicuously lacks a shopping channel, for which Microsoft's Mac business team deserves an extra bit of praise.



**SPORTING A NEW look and a media toolbar, Internet Explorer 5.0 is ready to take over the Mac Web browser market. Oh, wait— isn't that what Microsoft got in trouble for in the first place?**

### Carrara

MetaCreations

<http://www.metacreations.com>, \$399

As the next completely rewritten version of Ray Dream and Infini-D, MetaCreations Carrara 1.0 arrives on the scene with complete 3D modeling and animation capabilities. Carrara 1.0 combines an intuitive and easy-to-use interface, a blazingly fast rendering engine, and a price normal people can afford. Some of the nifty features include a hybrid ray tracer, several modelers, multiple particle systems, fully 3D light sources, and real-time MetaBalls. If you're into 3D, definitely give Carrara a try.

### MacIntax

Intuit

<http://www.macintax.com>, \$29 (\$49 for Deluxe)

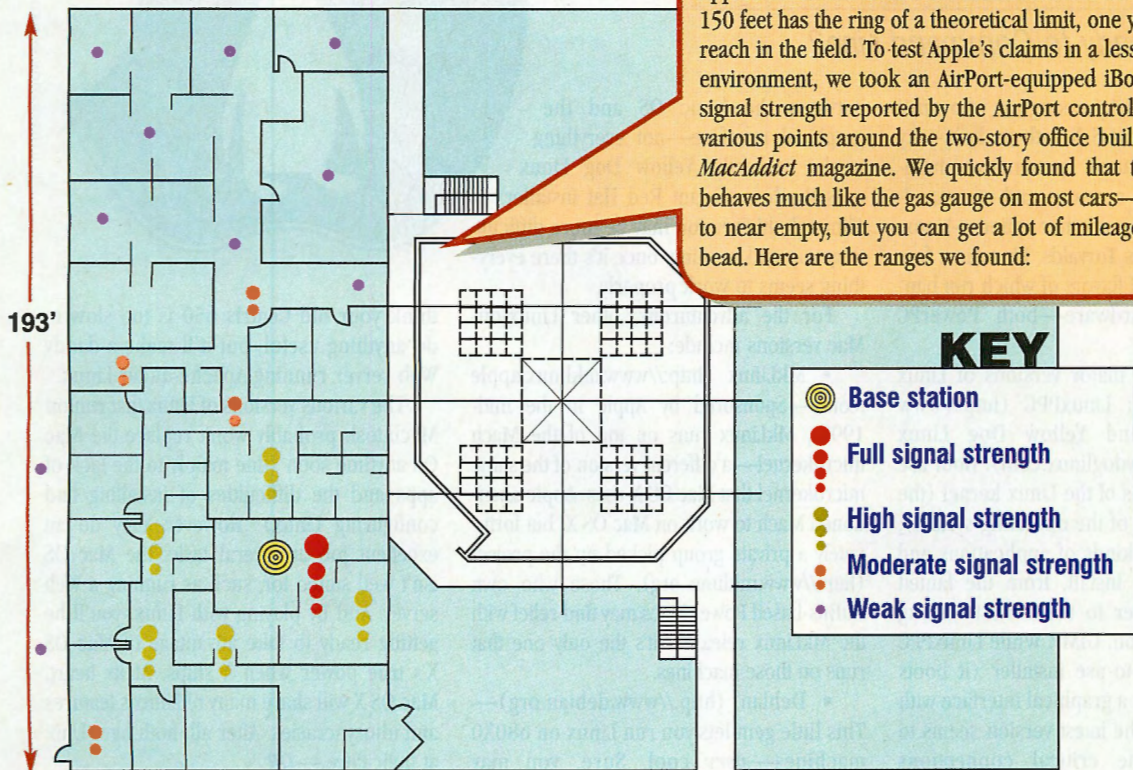
You're not going to escape it this year, either—taxes are just around the corner, and no matter what you do, the IRS will get its share. This time, though, you can make sure that share is as small as possible with the newest version of MacIntax from Intuit. The 1999 version has a better interview process, better Web integration, and easier navigation. This year, Intuit is offering one state tax form free with your copy of MacIntax Deluxe. This is your chance to make sure The Man gets as little as possible.—*DR*



# Inside the Saucer Section

## Piles and Piles of Airport Info

**N**ow that AirPort cards and base stations are becoming readily available, attention is turning from simply getting the devices to making them work well. We've been conducting our own tests and sweeping Apple's site for information. Here's what we've found. —JS



### So how far does it really go?

#### WE TEST THE IBOOK'S AIRPORT RANGE

Apple's claim that an AirPort connection has an effective range of 150 feet has the ring of a theoretical limit, one you're unlikely to reach in the field. To test Apple's claims in a less-than-controlled environment, we took an AirPort-equipped iBook and read the signal strength reported by the AirPort control strip module at various points around the two-story office building that houses *MacAddict* magazine. We quickly found that the control strip behaves much like the gas gauge on most cars—it quickly drops to near empty, but you can get a lot of mileage out of that last bead. Here are the ranges we found:

#### KEY

- Base station
- Full signal strength
- High signal strength
- Moderate signal strength
- Weak signal strength

TO OUR SURPRISE, Apple's 150-foot range estimate was roughly correct—even in our crowded offices.

## Hello? Hello?

### Sources of AirPort interference?

Many owners of wireless devices (phones, computers, keyboards, whatever) develop a strange type of paranoia. Every kitchen appliance, television set, and family pet becomes the scapegoat for connection failures. Otherwise fearless people have been known to cringe at the thought of interposing a wall between their mobile device and its base station. This fear isn't always unwarranted (except in Fido's case)—a few common household devices can cause serious interference in the AirPort's signal, resulting in slower connections and lower range.

#### DEVICES TO AVOID

- Active microwave ovens shouldn't be anywhere near AirPort devices—the potential for interference is great.
- Older DSS satellite dish cabling tends to leak signal, possibly causing interference. (Newer cabling doesn't have this problem, so replace your wires if you're having problems).
- In case you haven't noticed, power lines, electrified railroad tracks, and power stations tend to do very, very bad things to radio reception. AirPort is no exception—stay away from these sorts of instal-

lations. Of course, if you live under transmission lines, you're out of luck.

- Some cordless phones use precisely the same technology (2.4GHz Direct Sequence Spread Spectrum) as AirPort—this, too, can cause interference. You can get back online by switching channels on your AirPort.
- Metal objects are just as good at blocking AirPort's transmissions as they are at interrupting radio waves—steer clear of them if you can.

Most of the walls and partitions you find around the home or office aren't much of a worry when it comes to the AirPort signal, but a few types can present serious problems. Here's how much you need to worry:

Don't sweat it much: wood, plaster, plastics, glass

Might be a problem: water, bricks, marble

Almost certainly a problem: paper rolls, concrete, bulletproof glass

Hello? Is anyone there?: metal



## get info

# Linux: The Forbidden Fruit

## Are You Ready to Command Line?

**F**or the truly geeky among you who *can't wait* for Mac OS X with its hoity-toity buzzword compliance (preemptive multitasking, protected memory, and command-line access), there is another option—Linux. A creation of Linus Torvalds, Linux is a free Unix clone, several flavors of which run happily on Mac hardware—both PowerPC and 680X0.

Currently, two major versions of Linux work on a Mac: LinuxPPC (<http://www.linuxppc.org>) and Yellow Dog Linux (<http://www.yellowdoglinux.com>). Both use up-to-date versions of the Linux kernel (the deepest plumbing of the operating system), and ship with all kinds of applications and services ready to install, from the famed Apache Web server to the almost unsung graphics application, GIMP. While LinuxPPC provides an easy-to-use installer (it boots from a CD and has a graphical interface with mouse control), the latest version seems to be missing some critical connections

between the basic OS and the graphical interface—not everything works correctly. Yellow Dog Linux uses the less elegant Red Hat installer. Although this version may be more difficult to get up and running, once it's there everything seems to work properly.

For the adventurous, other Linux-on-Mac versions include:

- **MkLinux** (<http://www.mklinux.apple.com>)—Sponsored by Apple in the mid-1990s, MkLinux runs on top of the Mach microkernel—a different version of the same microkernel that Mac OS X uses. Apple abandoned Mach to work on Mac OS X, but fortunately a private group picked up the project (<http://www.mklinux.org>). Those who own NuBus-based Power Macs may find relief with the MkLinux release—it's the only one that runs on those machines.

- **Debian** (<http://www.debian.org>)—This little gem lets you run Linux on 680X0 machines—*very cool*. Sure, you may

think your old Centris 650 is too slow to do anything useful, but it'll make a dandy Web server running Apache under Linux.

The various versions of Linux that run on Macintosh probably won't replace the Mac OS anytime soon (due mainly to the lack of apps and the difficulties of installing and configuring Linux). However, they do an excellent job at several tasks the Mac OS isn't well suited for, such as running a Web server. And by playing with Linux, you'll be getting ready to take advantage of Mac OS X's true power when it ships. At its heart, Mac OS X will share many of Linux's features and idiosyncrasies. After all, both have Unix at their core.—DR



ILLUSTRATION BY DAVID "BUSY" ROSS

# Update or Die

## Mac OS 9 Requires a Little Preparation

**E**ven on a Mac, upgrading to a new version of the system software can be a real pain in the butt—updates, conflicts, and mysterious glitches tend to attack the unwary, and Mac OS 9 seems to have more than its share of these gremlins. To help you out, we created a partial list of software with Mac OS 9, er... *issues*; look it over

and update where you need to before upgrading your OS. (Most of the programs having problems either have updates available or will by the time you read this, so go to company Web sites for the latest drivers or patches.)—DR

**Adobe Premiere** (<http://www.adobe.com>)  
—Update to 5.1c

**Adobe Type Manager** (<http://www.adobe.com>)  
—Update to 4.5.2

**AppleWorks** (<http://www.apple.com>)  
—Update to 5.0.4

**Conflict Catcher** (<http://www.casadyg.com>)  
—Update to 8.0.6

**Expression** (<http://www.creaturehouse.com/download.html>) —Update to 1.05

**Dave** (<http://www.thursby.com>)  
—Update to 2.5

**Microsoft Office 98** (<http://www.microsoft.com>)  
—Run the Mac OS 9 updater

**RealPC** (<http://www.fwb.com>)  
—Update to 1.0.9

**Retrospect** (<http://www.dantz.com>)  
—Update to 4.1E

**SoftRAID** (<http://www.softraid.com/Updates.html>) —Update to 2.2.1

**StuffIt** (<http://www.aladdinsys.com>)  
—Update StuffIt Deluxe to 5.1.5;  
update StuffIt Expander to 5.5

**TechTool Pro** (<http://www.micromat.com>)  
—Update to 2.5.3

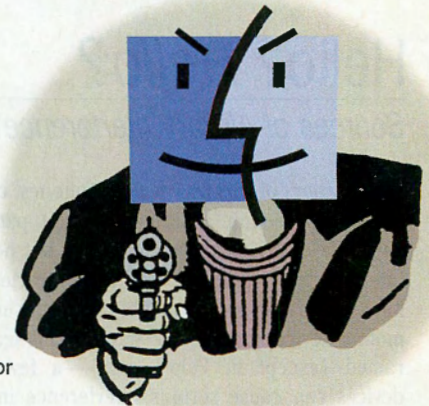


ILLUSTRATION BY DAVID "BUSY" ROSS



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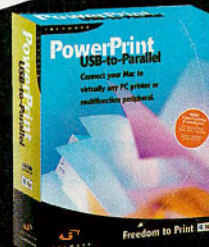


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# scrapbook

Every day is a holiday at *MacAddict*!

## Tchotchkes Galore

by David Reynolds

On a pretty regular basis, we get some fun—and not always computer-related—toys in the editorial offices here. Some are promotional toys from various companies, while others come from readers. Either way, they're a blast. Here's a sampling of the gewgaws and doodads that make it our way.

### Bondage Bunny

A pair of our faithful readers sent in this toy Intel bunny with an added twist—he bound its arms and legs to prevent it from wreaking any havoc. Thanks, Dan and Vin.

### Aspyr Football

To commemorate the release of Madden NFL 2000, Aspyr provided lots of Nerf footballs bearing its logo.

### Myth Surly Dwarf Ale

In one of the cleverest trinket handouts ever, Bungie gave away several bottles of Surly Dwarf Ale with the release of *Myth: The Fallen Lords* a few years ago.

### Dinosaur and Iron

They go so well together—in that Dada way—that we just couldn't resist. The dinosaur comes from Andromeda Software (maker of fine Photoshop filters), and the iron comes from Rowenta Steam Iron company, who wanted to let us know that it, too, has a cool aqua-colored translucent product that came out before the iMac.

### Adobe Acrobat Pocket Knife

Meant to exemplify Acrobat 4.0's versatile nature, this knife has also proven useful for opening computer cases and bottles of wine.

### Knowledge Adventure Mug

If your child is drinking coffee from this stylish stainless-steel travel mug, you've done *something* right in your parenting career.

### Freeway Flying Disc

It flies like a frisbee—that's because it is one. SoftPress launched this colorful plastic circle at us to hype Freeway. Note the scuffs—we've used it a bit.

### GoLive CyberStudio Walking Box

The Web site creation software company gave away these clever (if slightly irritating) walking versions of its box—before Adobe bought GoLive.





# Feel the music!



No matter what your taste in tunes, you'll dig the new **CD-ROM ToolKit™ 4.0** from FWB Software. Now with full **MP3 Support**, our award winning CD-ROM driver gives you complete control over your music listening experience while sitting in front of your computer. Disco, rock, punk, or old junk—it all sounds better with **CDT Remote™**. And with our graphic **CDT Equalizer™**, you can fine tune the sound according to your personal listening preferences.

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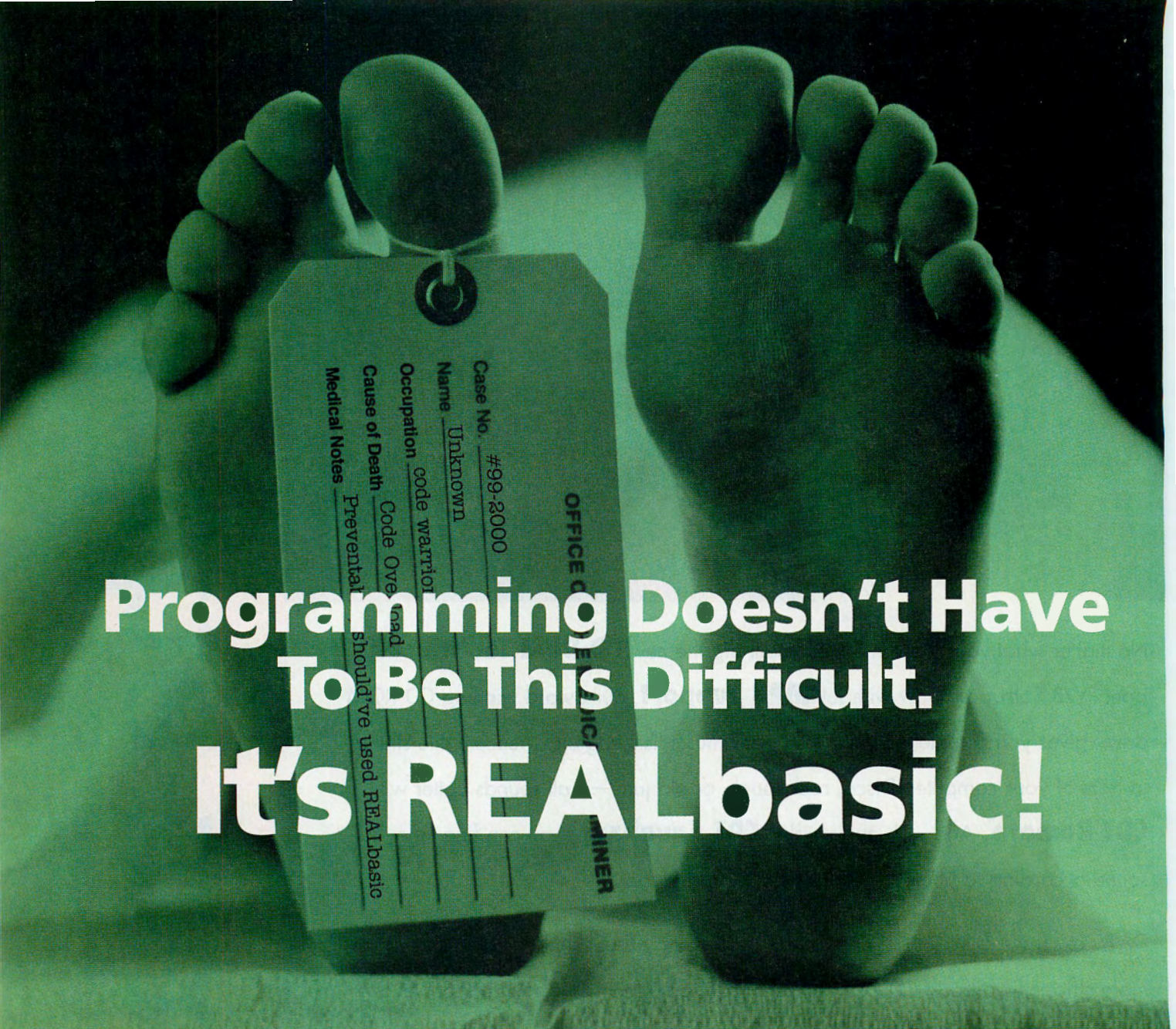
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# Apple's Revolutionary New

# OS

*By Ian Sammis and David Reynolds*



OS  
X

**M**ac OS X, which debuted at Macworld Expo this January, has been almost a decade in the making. Since the early '90s, Apple has been working on a modern operating system—first as Copland, then as Rhapsody, and lately as Mac OS X (the user interface is code-named Aqua)—and it appears the company may finally be on the cusp of achieving its goal.

Mac OS X will be more responsive, more stable, and far more powerful than its predecessors (including Mac OS 9), and it will run

almost all older applications without requiring upgrades. But more important, Apple has completely overhauled the user interface—and this one promises a lot of flashy eye candy and a completely different computing experience from anything you've ever encountered. In fact, according to Steve Jobs, when you see it, you will want to lick it.

Apple plans to release a beta in spring and a final version this summer, and will ship all new Macs with OS X by January 2001. Here's a sneak peek at the next big thing from Apple.

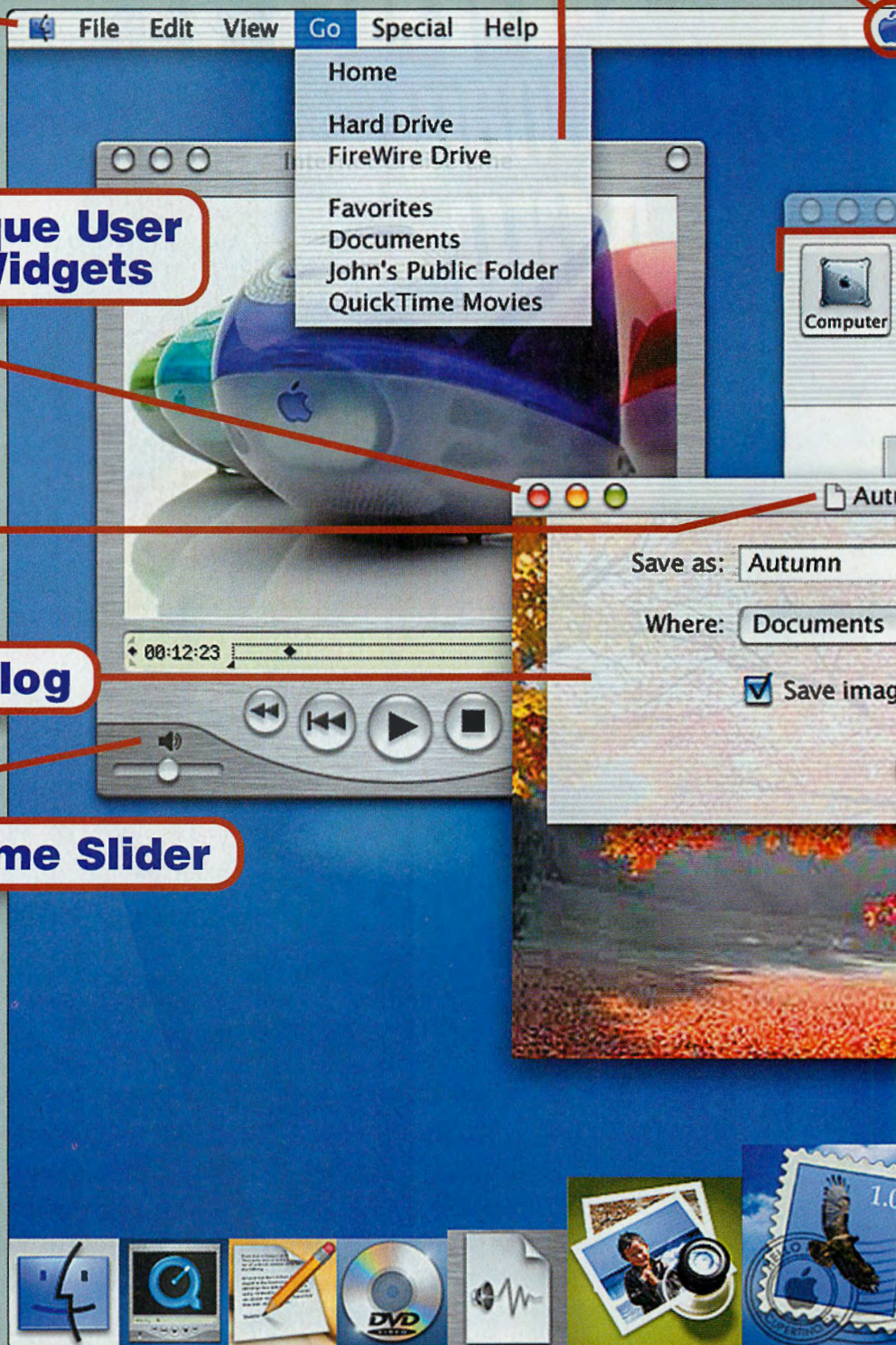


**Just Eye Candy****Brand New Apple Menu****Translucent Menus****Gumdropesque User Interface Widgets****Title Bar Icon****New Save Dialog****QuickTime Volume Slider**

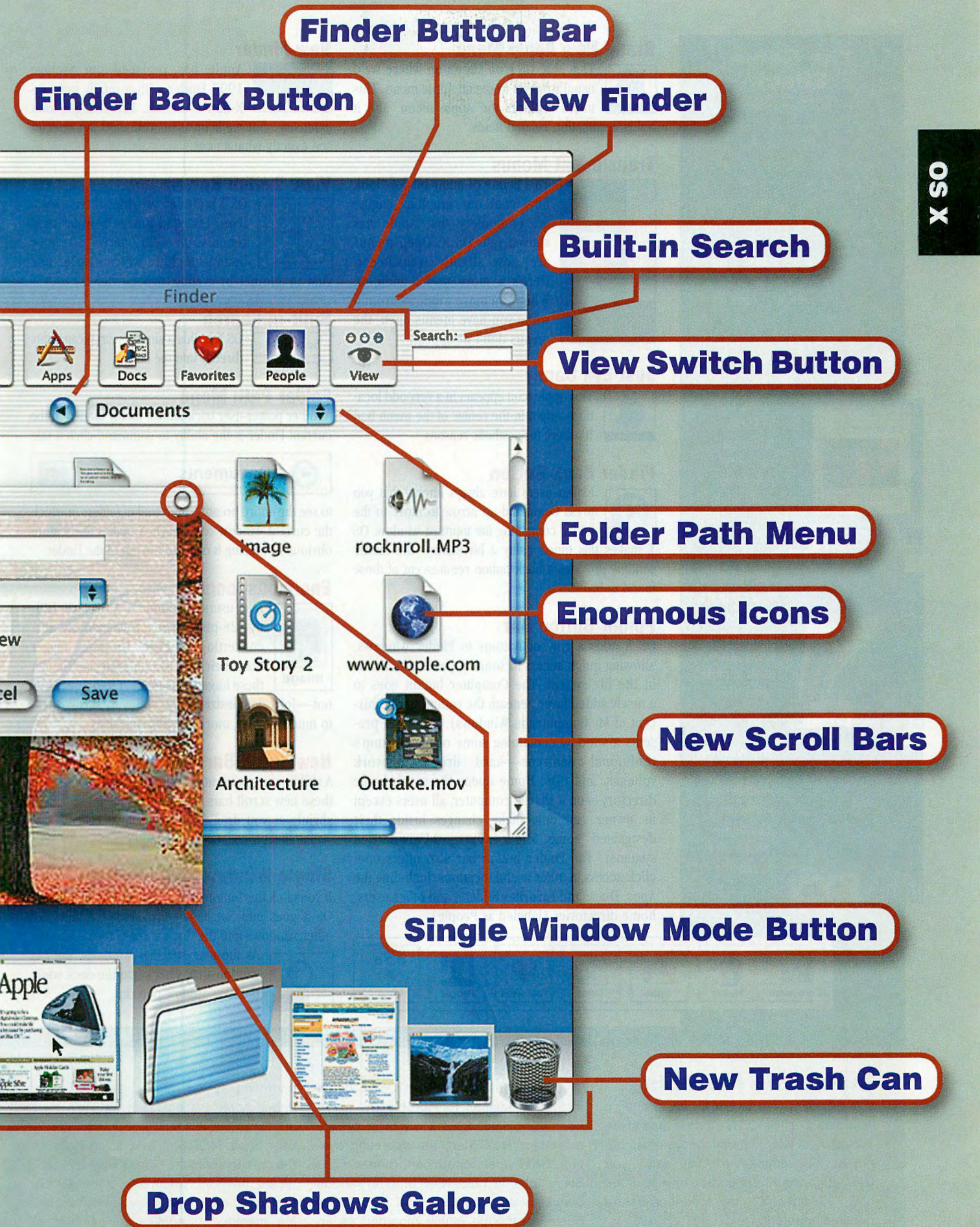
## Mac OS X Unveiled

Here it is—the long-awaited first look at the Mac OS X user interface. Mac OS X's new interface integrates the best elements of OpenStep into the Mac OS with style and flare. The Finder hasn't gone away, but it has undergone a transformation, as has everything from window controls to scroll bars. Aqua also showcases the awesome graphics power of Mac OS X's graphics engine, known as Quartz. Built around Adobe's Portable Document Format (PDF), OpenGL, and QuickTime, Quartz can generate transparencies and drop shadows on the fly.

Let's take a look at Mac OS X's public face.

**The Dock**







## The Genie Effect

In a bid to waste processor cycles on eye candy like no OS before, Mac OS X animates minimizing and restoring windows with a feature the company has dubbed the "genie effect." When you click the Minimize button, the window squeezes down into the dock like a genie shrinking back into its bottle—you get the reverse effect when you remove an item from the dock. These screen shots, taken from a movie on Apple's Web site, show how the effect works.



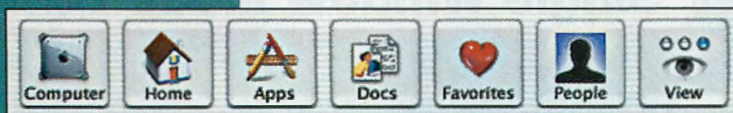
CLICK THE YELLOW Minimize button to trigger the genie effect.



THE WINDOW flows into its place on the dock, and the icons move apart to make room. How nice of them!



THE WINDOW becomes just another tile in the dock, awaiting a mouse click to unbotle it.



## Brand New Apple Menu



This Mac OS icon shows up where we'd usually expect to see an Apple menu. This menu replaces the Apple menu, and it holds application-related items.

## Translucent Menus



This is one of many bits of "look how cool our graphics engine is" tomfoolery that Apple has shoved into OS X: Open menus are now slightly translucent. Here's a more useful addition: When you move windows around while you have menus open, the menus don't disappear.

## Just Eye Candy



This Apple icon appears in a very odd location—right in the center of the menu bar. It's there for aesthetic reasons.

## Finder Back Button

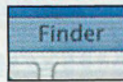


Expert users have always known that you press Command-up arrow to move to the folder containing the topmost window. OS X makes this functionality a bit easier—the Finder window provides a back button reminiscent of those found in browsers.

## Finder Button Bar

OS X adds a row of buttons to Finder windows, allowing quick access to some important locations in the file system. The Computer button goes to a newly added layer beneath the volumes (reminiscent of My Computer in Windows). This layer presents a window containing some of the desktop's traditional denizens—hard drives, network volumes, and CDs. Home opens the user's home directory—on a shared computer, all users except its owner can only make changes inside their designated "home" folder (as in most Unix-derived systems). The Finder button bar also offers one-click access to other useful locations, including the Apps, Docs, and Favorites folders, and other users' home directories (labeled as People).

## New Finder



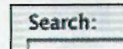
Apple has replaced our vintage 1997 Finder with a totally new, OS X-native version. The changes look extensive, but we'll have to wait until summer to see exactly what's new.

## View Switch Button



OS X's Finder provides three views: Icon, List, and a new Browser view reminiscent of OS X Server. The View button simplifies switching from one view to another by cycling through views.

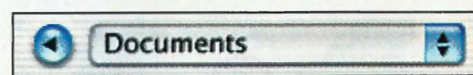
## Built-in Search



OS X builds a simple search capability directly into the Finder.

## Folder Path Menu

Another power-user trick almost totally hidden in the current Finder is the ability to command-click a title



to see the entire bread-crumble trail of folders in which the current window resides. OS X makes this feature obvious by placing it close to the top of the Finder.

## Enormous Icons



Mac users may find OS X Server's 128-by-128-pixel icons tremendously disconcerting—they're 16 times bigger than their Mac OS equivalents. Though these huge icons made it into Aqua, fear not—Jobs demonstrated the ability to shrink them to much smaller, more eye-pleasing sizes.

## New Scroll Bars

A still image can't quite capture the beauty of these new scroll bars. They appear to ripple slightly as you drag them—an appropriate visual effect for an OS named Aqua.



## Single Window Mode Button

If you click this button at the right side of the title bar, OS X goes into Single Window Mode, shuffling all other windows into the dock at the screen's bottom.



As the user switches windows, the old window drops back into the dock while the new window pops up.

## Inside the Plumbing

If Aqua were all Mac OS X had to offer, it would be a bit like OS 8—a solid step in the evolution of Mac operating systems, but not terribly remarkable. Only when you take into account the underpinnings of the new OS does X's revolutionary nature become apparent.

Despite the name, Mac OS X bears almost no relation to the Mac OS we've been using since 1984. OS X most closely resembles NeXTStep, the operating system NeXT first introduced (under CEO Steve Jobs) in 1986. NeXTStep (at various points called OpenStep and Mac OS X Server), although highly regarded as an

operating system, never really took off; under Apple's auspices it will now have another shot, this time with a much larger user base. NeXTStep has always offered the core features the Mac OS lacked—protected memory, preemptive multitasking, and a well-implemented system for assigning memory to applications. Now, with



## New Trash Can



This icon—presumably the Trash Can—sports a retro stainless-steel wire-basket look in OS X. The Trash can always anchors the right side of the dock.

## Drop Shadows Galore



Mac OS X builds in drop shadows at a fundamental level—every window has its own drop shadow, complete with a semitransparent alpha channel.

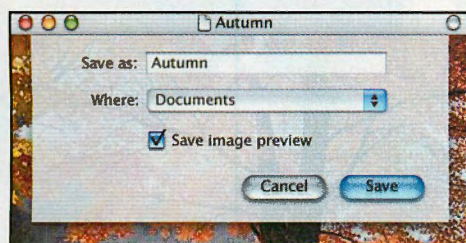
## The Dock

The dock, strongly reminiscent of the OpenStep dock (and somewhat similar to the Windows Task Bar, which came later), holds your open applications and minimized windows, and grows and shrinks as you add or remove items. When the dock fills up (it can hold up to 128 items), the icons shrink to fit; rolling the mouse over items in the dock magnifies them for easier identification. Pop-up windows meets *The Matrix*.



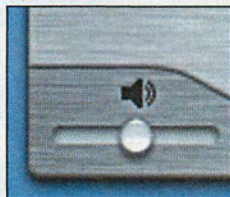
## New Save Dialog

The new Save dialog box slides out of its associated window, and it's nonmodal—that is, it doesn't take control of your Mac until you perform an



action. Notice that the dialog box is semitransparent—except for the text. Default buttons now pulse like a colorful strobe light, rather than just having a double black border.

## QuickTime Volume Slider



At last the obnoxious analog-style volume dial in QuickTime 4 has gone by the wayside. In the preview version of Mac OS X, the QuickTime player sports a normal-looking volume slider—and a set of controls that make sense. Plus, the notoriously hard-to-use favorites drawer is conspicuously absent.

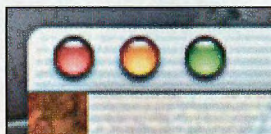
## Title Bar Icon



We've seen these icons in title bars before (Mac OS 9 has them), and they're ready to go in Mac OS X, too. Use this title-bar icon as a proxy for the open window. To drop an item into the window, for example, just drag the item onto the icon; or you can drag the icon to the desktop to create a shortcut.

## Gumdropesque User Interface Widgets

Mac OS X features a new set of window controls—from left to right, they are the Close button, the Minimize button, and the Maximize button. Roll the mouse over these widgets, and an X, a minus sign (-), and a plus sign (+) show up in colored circles. The red Close button closes the window, the yellow Minimize button sends it to the dock, and the green Maximize button works like the zoom box in older versions of Mac OS. This doesn't seem very intuitive, but neither were the original close and zoom boxes.



Carbon and Aqua layered above it, OS X should provide all of the Mac OS's advantages with none of its drawbacks.

## The Browser

For the most part, Aqua strongly resembles the current Mac OS, albeit with vastly superior visual effects. However, some changes to the GUI run deeper than making close boxes resemble drops of cough syrup. In particular, Apple has added a view called the Browser that can, in some situations, provide a very powerful way to navigate through files.

In file viewer parlance, a browser is a columnar view in which each column contains the contents of the folder selected in the

previous column. With a browser, you can quickly tunnel through a series of nested folders and deal with several nesting levels simultaneously in the same window. Power users will love this view (as will OpenStep fans—the browser is one of the most popular features of NeXT's operating system), but novices are best advised to leave it alone—it's all too easy to get hopelessly lost in the depths of your operating system while you're just trying to have a quick look around.

## Oh, the Things You Can't See

So you think you've seen it all? Think again. Apple unveiled a feast of other cool Mac OS

X features during January's Macworld Expo that the screen shot doesn't make evident. Perhaps the most amazing (and un-Windows-like) feature of all is the improved stability and crash immunity. In OS X, when an application crashes, it doesn't bring down other applications or the whole system along with it. In addition, a new font panel allows users to organize fonts easily into collections—and, of course, to buy new fonts via the Internet. Finally, in the "it's about time" category, you no longer have to activate windows to shut them.

Ian Sammis and David Reynolds survived Macworld Expo to write this feature—thanks in part to Jack in the Box.

## A New Way to Save

Mac OS X changes the way you save documents by associating the Save dialog box with the window containing the data you're saving. The semitransparent Save dialog box slides out at the bottom of the title, and it doesn't tie up Mac OS X until you press the Save or Cancel button, as in previous versions of the Mac OS. Here's how this cool animation looks.

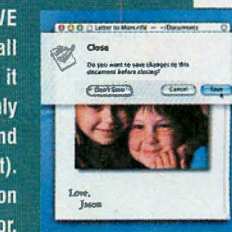
CLICK THE CLOSE widget in an unsaved document's window, and the Save box appears.



THE SAVE DIALOG BOX slides out from the bottom of the title bar—like the *Star Wars* opening credits in reverse.



THE NEW SAVE panel unfolds, all ready to go—and it even looks freshly starched (and semitransparent). The default button pulses with color.









# KILLING TIME WITH 20 MAC PROJECTS YOU CAN DO IN 20 MINUTES OR LESS!

BY KEVIN SAVETZ

It's 4:40 p.m., and you're getting ready to leave the office. Or maybe you're at home, waiting around for a ride. Or dinner won't be ready for a while. For whatever reason, you've got 20 minutes to kill in front of your Mac, and you're just itching to do something useful with all those seconds (that's 1,200 *whole seconds*, folks). You could spend that time aimlessly surfing the Web or playing with the Jigsaw Puzzle. Or you could embark on a project, complete it in 20 minutes, and perhaps learn a new trick or two in the process. Doesn't that sound more exciting than degaussing the monitor repeatedly? Sure, you won't get that cool flashback effect, but you might accomplish something more worthwhile.

Good souls that we are, we've come up with 20 projects you can do with your Mac, each of which takes 20 minutes or less. Think of them as practical time-killers, if there is such a thing. So pick one, try it, and make the most out of every moment. Or if you have a whole day and nothing else to do, you can complete all 20 in less than seven hours for a real sense of accomplishment.



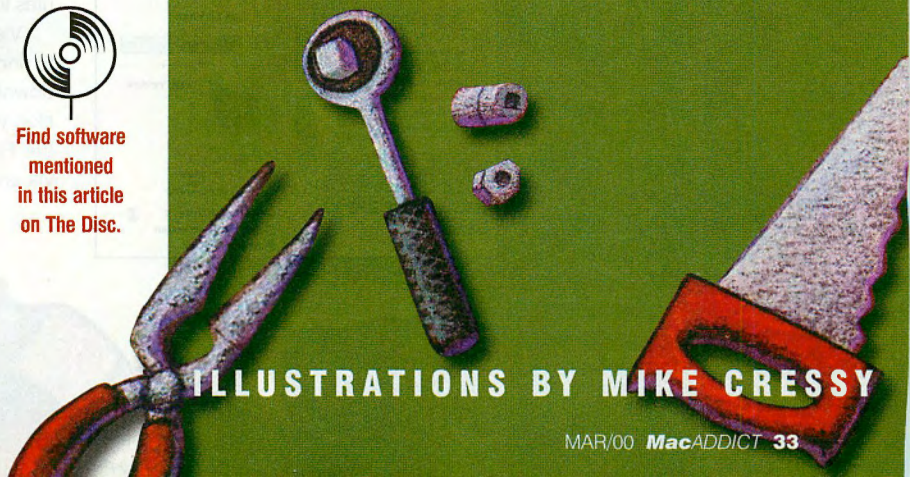
Find software  
mentioned  
in this article  
on The Disc.

20 projects

## PROJECT 1: SET UP A WEB CAM

In just 20 minutes, you can be among the elite few...uh...million people who have a Web cam on their desks. Point your QuickCam or other video source at your desk, at the cat's bed, or out the window. Next, install a Web-cam program such as CoolCam (\$20, <http://members.aol.com/yuv422>) or SiteCam (\$149, <http://www.rearden.com/sitecam>) so the world can watch your desk, your cat, or your window. They will just throng to see it all.

You don't even need a fast Internet connection to serve those scintillating images. Either program can periodically upload images to an FTP server at your ISP, where you can easily make them part of your Web page. If you have bandwidth to burn, you can send out streaming video or time-lapse QuickTime movies generated by your Web cam.



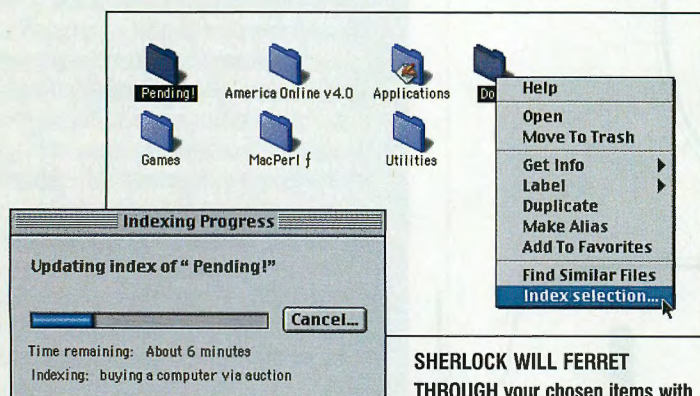
ILLUSTRATIONS BY MIKE CRESSY



## PROJECT 2: INDEX A FOLDER

Sherlock's Find By Content function is the best way to search for a snippet of text since the bloodhound came along. Problem is, it won't work until you've indexed your hard drive—and you need to update that index from time to time. Unfortunately, building an index of a large hard drive can take hours—many, many, many hours.

How can you create or update the index for a folder or two quickly? Control-click a folder or several folders and choose Index Selection from the contextual menu that pops up. Your Mac will dutifully (and quickly) update the Sherlock index for just those items. It's a lot faster than waiting for the whole shebang to process.



**SHERLOCK WILL FERRET THROUGH** your chosen items with the Index Selection command.

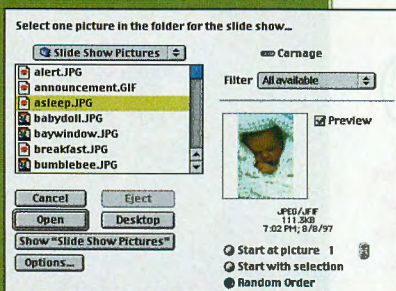
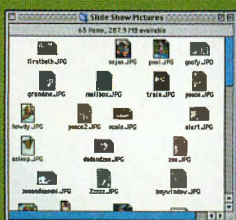
## PROJECT 4: CREATE A DIGITAL SLIDE SHOW WITH YOUR PHOTOS

You probably have graphics files littering your hard drive, so why not use them to create a digital slide show? The quickest way is with Graphic-Converter (\$35 shareware, <http://www.lemkesoft.com>).

**STEP 1:** Toss all your images into a single folder. Feel free to mix and match file formats.

**STEP 2:** Launch Graphic-Converter. Choose the Slide Show function from the File menu (Command-D). Find your picture folder and choose any image in it. Tweak the options to your taste.

**STEP 3:** A simple toolbar allows you to control the flow, or you can let the program show random pictures at timed intervals.



## PROJECT 3: MAKE YOURSELF INTO AN ICON

How about squeezing your face into a 32-by-32-pixel square and making an icon of yourself? Sounds painful, but it's actually pretty cool. You can create a miniature self-portrait with any image editor. If you need a little assistance, use clip2icns, a shareware utility that helps create 32-bit icons (<http://www.mscape.com>). Here's how to do it.

**STEP 1:** Find a picture and scale it to a 32-pixel square. You'll also need to create a mask for it. (A square, all-black mask works well for portraits.) Copy it to the Clipboard.

**STEP 2:** Launch clip2icns and choose New Icon File. Press Insert to save the Clipboard as an icon.

**STEP 3:** You've been iconified! Now you can place your little clone onto countless folders and files.

For more icon-creation inspiration and tips, visit <http://www.iconfactory.com>.



## PROJECT 5: UPDATE YOUR SOFTWARE

If you've got software—and you look like someone who does—chances are at least one of the programs on your Mac is out of date. In fact, we'd bet on it. The good news is that software developers constantly update programs to add features and stomp out bugs. The bad news is that they don't come to your house personally to install the latest versions. So take a few minutes to check your system for software in need of updating.

Visit <http://www.versiontracker.com>, a site that makes it easy to find the latest version of thousands of Mac programs. You can download a patch by following a link. If you don't know what version you have now, click the app's icon and choose Get Info from the File menu (Command-I). VersionTracker can also notify you via email whenever an update comes out for your software.



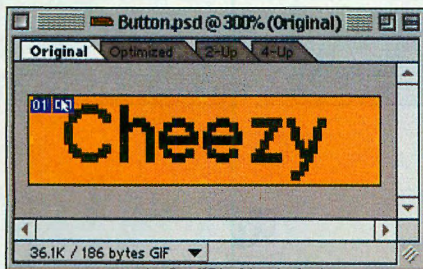


## PROJECT 6: CREATE ROLLOVERS FOR YOUR WEB SITE

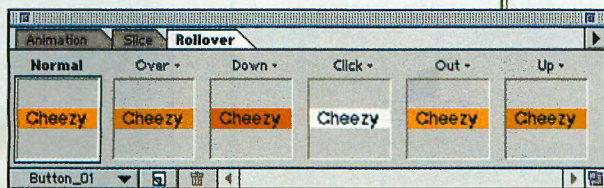
How about using your copious free time to spruce up your Web site with rollovers? These cool tricks make a graphic undergo a change when you move the cursor over it. Or you can make help text appear when you point to a particular part of the page (à la Microsoft's Tool Tips.)

You can create rollovers using JavaScript or Cascading Style Sheets. Since you don't have all day, it's fastest to throw the problem at a Web graphics editor such as ImageReady or Fireworks. We'll show you how to do it via JavaScript in ImageReady.

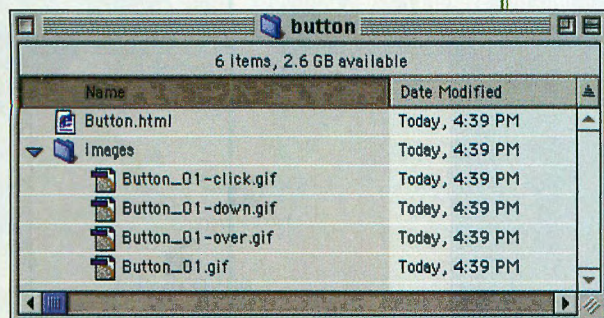
**STEP 1:** Open ImageReady and create a button you want to put on your Web site. This is the normal state of the button—how it appears when the Web page loads.



**STEP 2:** Click the Create New Rollover State to create five more buttons representing various icon conditions: Over (when you roll the mouse over the button), Down (when you press and hold the mouse button while the cursor is over the button graphic), Click (when you click the mouse button while the cursor hovers over the button graphic), Out (when you roll the mouse away from the button graphic—usually the same as the normal state), and Up (when you release the mouse button—usually the same as Over).



**STEP 3:** The last part is easy. Choose Save Optimized from the File menu, and ImageReady exports the proper HTML and images into whatever folder you select. Then you can open the HTML file, copy the JavaScript code, and paste it into the HTML file where you'll be using the button.



## PROJECT 7: ERGONOMIZE YOUR WORKSTATION

Thinking about your posture at the computer can be excellent preventive medicine. Take a moment to make sure your keyboard and mouse are within easy reach and you don't have to strain your neck to see the monitor.

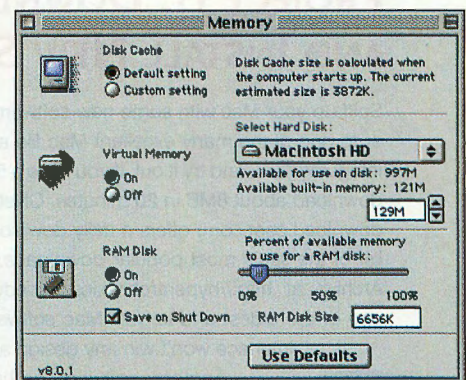
Here are some questions to ask yourself. How is your posture at the computer? Are your shoulders hunched? (They shouldn't be.) Are your feet flat on the floor? (They should be.) Do you crook your neck to one side to hold the phone while you type? (You shouldn't.) Do you hang your head forward while typing? (Don't. This can strain your back muscles.) Adjust all the components of your workstation accordingly. Then read the Typing Injury FAQ at <http://www.tifaq.org> to learn about carpal tunnel syndrome and other repetitive-stress injuries that typing and using a mouse can cause.

## PROJECT 8: OPTIMIZE YOUR BROWSER

If your Web browser has been acting pokey lately, it's time to whip it in to shape. Start by clearing its cache and setting it to a reasonable size—5MB is perfect in most cases, less is fine if you need to save disk space (but if you're down to 5MB of free hard drive space, you might consider upgrading). If you have RAM to spare, create a RAM disk via the Memory control panel and use it as the browser cache for extra speed. To adjust your cache settings in Netscape Communicator, choose Preferences from the Edit menu, then Cache from the Advanced tab. In Microsoft Internet Explorer, choose Preferences from the Edit menu, then Advanced from the Web Browser tab.

If you use Internet Explorer, take advantage of its Forms AutoFill function. To set this up, choose AutoFill Profile from the Preferences window. Fill out your name, address, and other sundry details. Next time you need to fill out a Web form, choose AutoFill Forms from the Edit menu. Press Command-equal sign (=) to fill in the forms automatically.

If you don't usually use Java-enabled sites, consider turning off Java support in your browser. This eliminates the annoying Java startup wait you must otherwise endure when visiting random Web sites that subject you to useless Java tricks, plus you don't run the risk of Java-related crashes. Of course, if a new site doesn't work as advertised, you may have to turn Java on again to use the site.



**USE THE MEMORY control panel to create a RAM disk for your Web browser.**



## PROJECT 9: RECORD NEW SYSTEM SOUNDS

When Sosumi and Simple Beep have worn out their welcome, it's time to create your own system sounds. Plug in your microphone or pop a favorite CD into your CD-ROM drive. Now open the Monitors And Sound control panel. Press the Sound button and select the input source. Next, press the Alerts button, then click Add. Use the controls to record your sound, but remember to keep it short—preferably under a second, two at most. Sound really eats up memory and hard drive space.

For a more elegant recording interface, as well as the ability to convert sounds from other formats, try Ultra Recorder (\$20 shareware, <http://members.aol.com/ejc3/Ultra.html>).

## PROJECT 10: CHECK OUT A DEMO ON THE DISC

Do you think we spend hours upon hours creating The Disc just for our health? We do not. Besides including a space filler of questionable utility (ahem, the staff video), we pack The Disc with dozens of great software demos. So remove that coffee cup from The Disc, put it (the media, not the mug) into the Mac, and try out some of that new software. You may find some choice tidbit you love—and you'll find several of the utilities this article mentions.

## PROJECT 11: DOWNLOAD AND INSTALL NEW STUFF

Spiff up your Mac with some new software. Point your Web browser to one of the many excellent Mac file archives, download some intriguing item, and try it out. If you have a 56-Kbps modem, you can download about 8MB in 20 minutes. CNet's Download.com (<http://download.cnet.com>) offers a daily download spotlight, as well as a list of the site's most popular downloads. Or try InfoMac's HyperArchive at <http://hyperarchive.lcs.mit.edu/HyperArchive.html>—it's one of the oldest and largest Mac software archives, although its interface won't win any design awards.

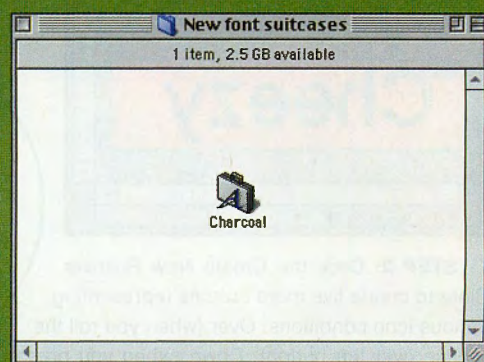
Another software archive, Macupdate (<http://www.macupdate.com>), offers a prominent listing of new software, with detailed information about each app. If your Mac is new, visit The Download Zone (<http://w3.trib.com/~dwood/software.html>), which offers a small selection of handpicked software basics, including graphics viewers, Internet clients, and utilities.

## PROJECT 12: MAKE FONT SUITCASES

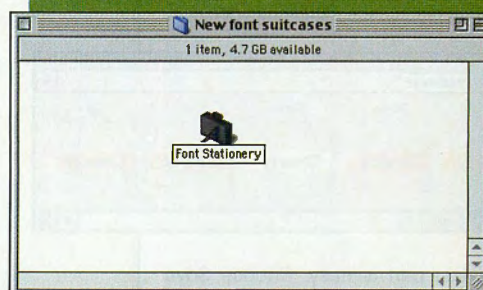
Even if you're not planning any travels soon, it makes sense to pack up your font suitcases. Suitcases keep the Fonts folder tidy by grouping related TrueType or bit-mapped fonts. For instance, you might use a suitcase to bundle Adobe Garamond, Adobe B Garamond Bold, and Adobe I Garamond Italic. Packing more fonts into fewer cases also means you won't hit the Mac OS limit of 128 open font suitcases so soon. (Yeah, we know—Mac OS 9 has a limit of 512 open font suitcases.)

To make a font suitcase and clean up your System Folder, here's what you do.

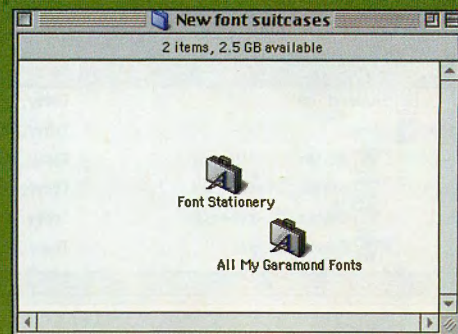
**STEP 1:** Create a folder as a temporary holding place for the new suitcases you're going to create, and copy any font suitcase into this new folder from the Fonts folder.



**STEP 2:** Rename the font suitcase Font Stationery and double-click to open it. This suitcase will act as a master template for all the other suitcases you set up to hold groups of fonts. Drag all files inside the open suitcase into the Trash, then empty it.



**STEP 3:** Use your newly created font suitcase as stationery. Make a copy of it and stuff that copy with fonts galore—say, all of your monospaced fonts or all the Garamond variants. Move the newly created font suitcase into the System Folder, and you're done!





## PROJECT 13: BURN YOUR OWN MP3 CD

Put that CD burner to good use by burning a CD of your favorite songs in MP3 format. Then you can listen to tunes on your Mac without clogging your hard drive with those corpulent MP3 files. If you haven't visited MP3.com yet, do so (<http://www.mp3.com>). You'll find great (and legal) recordings in every musical genre. Or log out and copy songs from your own CD collection as MP3 files onto a CD-RW for your own use. Remember copyright law, though—those songs must be for your use only, so you can't give those CDs away.

## PROJECT 14: CREATE AN INTERACTIVE MP3 JUKEBOX

Once you've got a disk full of MP3 tunes, it's time to play DJ. Use an MP3 player to arrange your files into playlists. Rearrange the songs on your favorite album or assemble tracks from various artists. Go ahead and create several playlists, one for each genre you enjoy: a jazz mix and a techno mix, for example. Here's how to do it with QDesign MVP (\$20 shareware, <http://www.mvpsite.com>).

**STEP 1:** Choose New from the File menu to start a new playlist.



**STEP 2:** For each MP3 file you'd like to add to the playlist, click the Add button, then choose the song file.



## PROJECT 15: BUILD A CUSTOM HOME PAGE

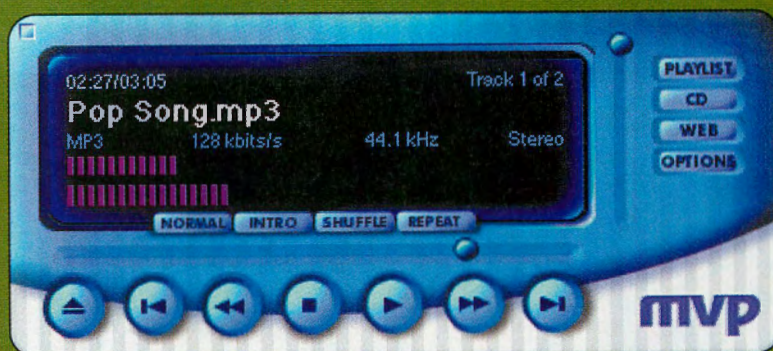
You may be one of the only people left without a Web page. You don't have to know HTML or even have a massive Pokémon collection to deserve a home page (and if you *do* have a massive Pokémon collection, your name must be Mark Simmons). If you have 20 minutes and something moderately interesting to say—or even if you want to rant incoherently—you can and should make yourself a little page on the Web. You'll need a Web page editor, so download a trial version of Freeway from <http://www.softpress.com> (or check one of our past discs for a free version) and get to work.

## PROJECT 16: TRY OUT A MACADDICT HOW-TO

Every issue has at least a couple of these—often several. Are we talking about taunting references to Prison Guy? Yeah, those too, but we really mean *How To*, the section of the mag that gives the nitty-gritty on how to accomplish something useful. Try one—it will take less time than a master's degree, and you'll probably learn more, too.

Recent issues have explained how to make interactive QuickTime movies, use your PowerBook as an external hard drive, and do amazing tricks with Photoshop. You'll often find the needed programs on The Disc, so you can get started right away.

**STEP 3:** When your song list is complete, click Save and name it.





## PROJECT 17: WRITE STEVE JOBS A LETTER

Take 20 minutes to let the big boss of your favorite computer company know what's on your mind. His email address is [sjobs@apple.com](mailto:sjobs@apple.com) (or so says Nikki—it may go into a vast collection of unread email). Or you can always send items (letters, pictures, worldly offerings, and so forth) via snail mail to Steve Jobs, Apple Computer, 1 Infinite Loop, Cupertino, CA 95014.

## PROJECT 18: CLEAN OUT YOUR HARD DRIVE AND SYSTEM FOLDER

When was the last time you opened your System Folder? Do you know what goes on in there while you're not looking? Installers leave fonts and SimpleText duplicates behind like rats leave droppings. Programs wantonly create preference files, cache folders, and help files. Detritus from long-forgotten software piles up. Take a few minutes and clean it out.

A quick glance in the System Folder may reveal entire folders you can toss in the Trash. My own Mac's system folder was harboring a ColorSync Profiles folder (although I've never used and will never need ColorSync), a Spell Catcher folder (although I stopped using Spell Catcher a year ago,) and a Eudora folder (ditto).

Also try Preference Packer (available from <http://www.spxtreme.com>), a tool for removing unnecessary items from your Preferences folder.

While you're in the cleaning, disinfecting, and ordering mood, peruse other folders looking for space wasters. A game you no longer play—trash it. A beta version of a crash-prone email client—nuke it. Clean up the mess you've created on your Mac's hard drive.

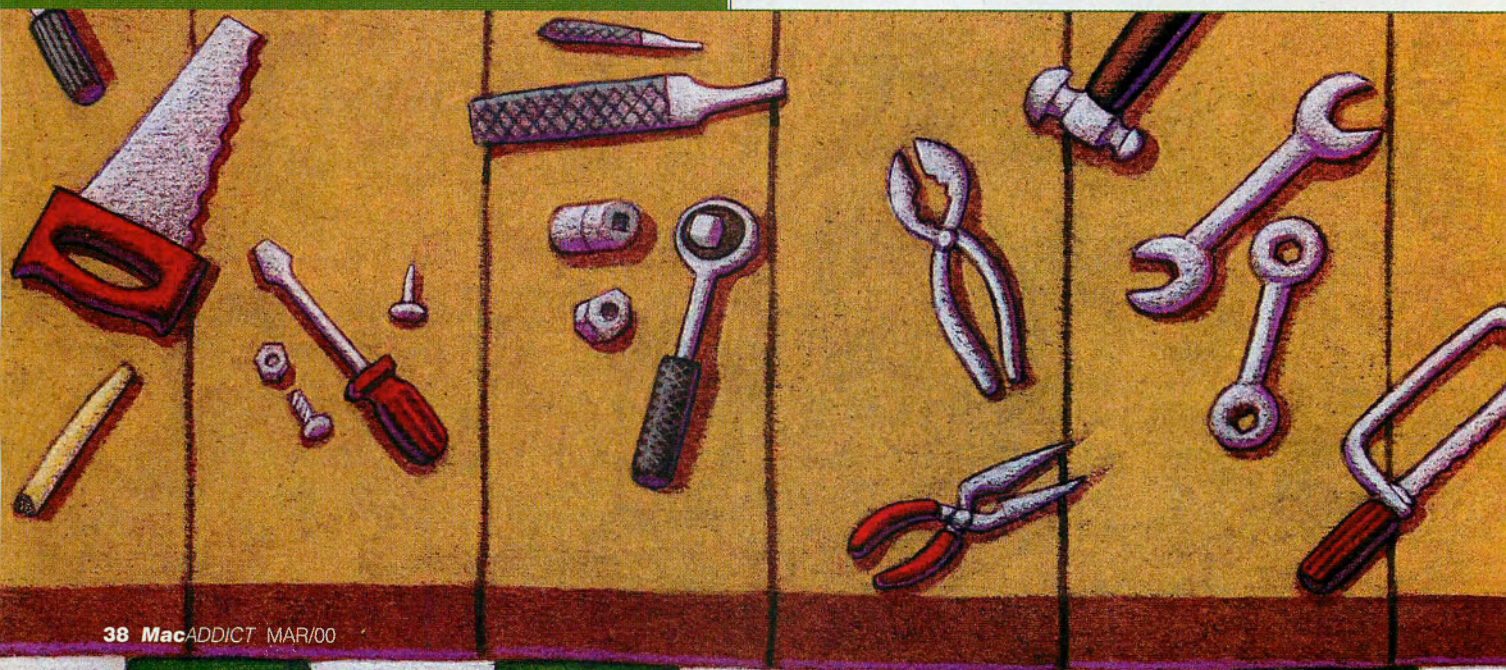
## PROJECT 19: MAKE YOUR OWN STICKER

Here's a 20-minute activity that's fun for adults and kids alike. Visit the stationery store (or just sneak into the office supply room—I won't tell) and get some sheets of sticky labels. They come in all shapes and sizes, from return-address format to full-page sheets. Put them in your printer, load up some graphics-editing software, and create your own stickers. You can grab clip art from a favorite Web site or even create your own with a graphics program. Finally, you've got a use for the color cartridge in your inkjet printer.

## PROJECT 20: SAY SOMETHING SMART IN A CHAT ROOM

Joining a chat room can be a great way to waste—er, spend some time and meet people. Drop by <http://chat.yahoo.com> for easy-to-use Java-based chat. If you're an America Online member, you'll find AOL's own chat rooms at keyword People Connection. Or you can try the granddaddy of Net chat—Internet Relay Chat. Visit <http://www.irchelp.org> for a helpful guide to IRC as well as a roundup of Mac IRC clients. There's also a very cool set of chats at World Without Borders (<http://www.worldwithoutborders.com>).

When Kevin Savetz ([savetz@northcoast.com](mailto:savetz@northcoast.com)) has 20 minutes to spare, he can be found playing old video games with MAME (Multi-Arcade Machine Emulator), learning to fly, or napping. Kevin also writes the weekly Geek for Sale column at [AuctionRover.com](http://AuctionRover.com).





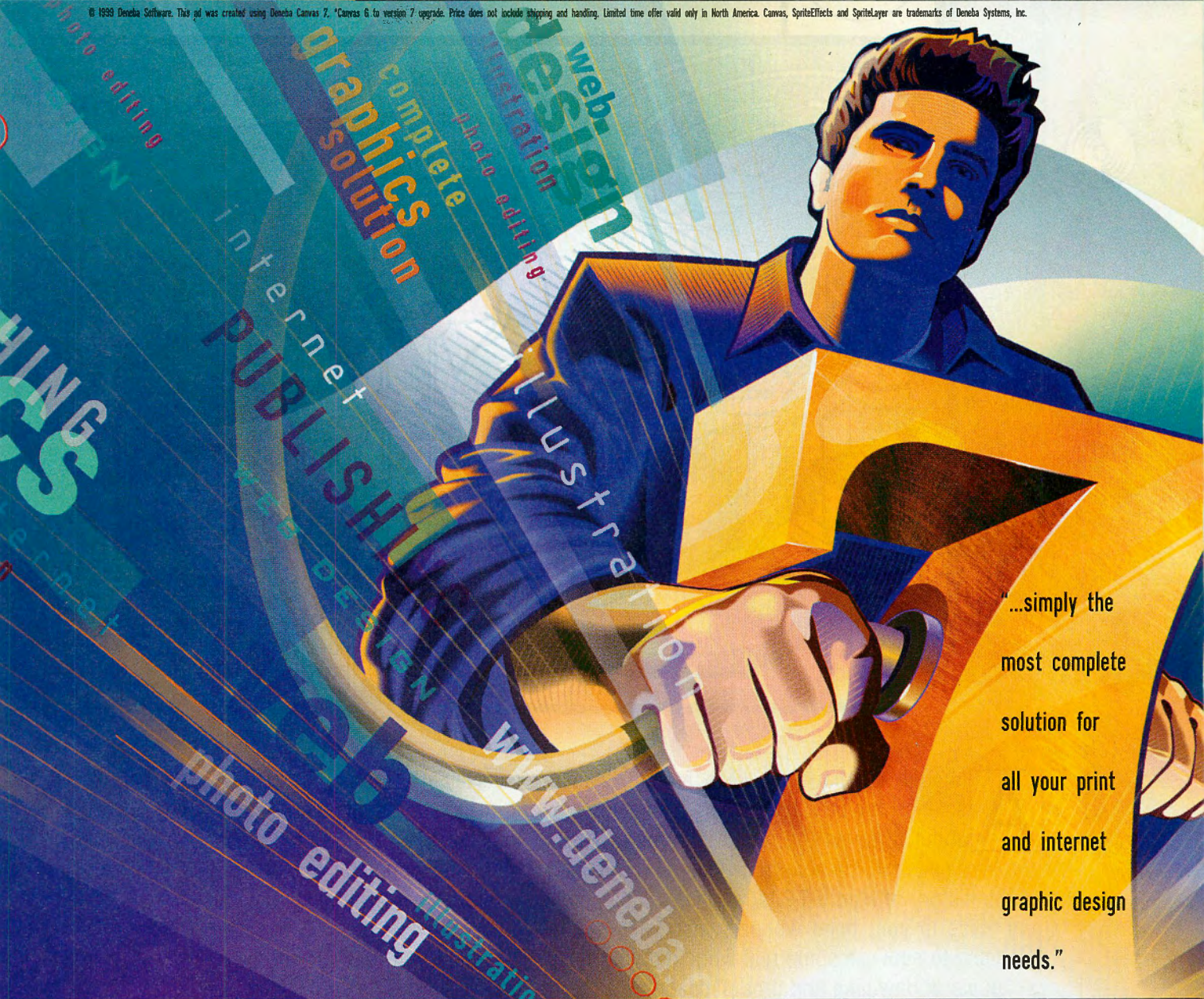
*Before Columbus, sailors stuck pretty much to the same old standard routes, fearing they would fall off the edge of the world and be eaten by sea monsters.*

*Fortunately, Christopher didn't believe in "standards."*

# WHAT'S YOUR EXCUSE?

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D E N E B A

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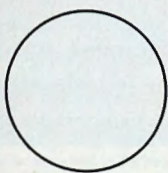
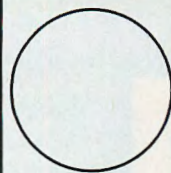






20 toys

# 20 TOYS



# FOR TECHIES

by Ian Sammis



**FIND SEISMIC**  
DUCK 1.4, Franklin  
1.1.4, MPJ Astro  
1.5.2, Gerry's  
Attraction 2.0b3,  
Curvus Pro 3.0.1,  
Conics 0.9.2,  
MacMolecule2  
Lite, a  
MacBreadboard  
1.1 demo,  
xTuringMachine  
1.3, Weather  
Tracker 3.0.4, and  
Planet Earth 2.1.2  
on The Disc.  
(Watch for The  
Disc icon—we've  
marked the apps  
that are on  
The Disc.)

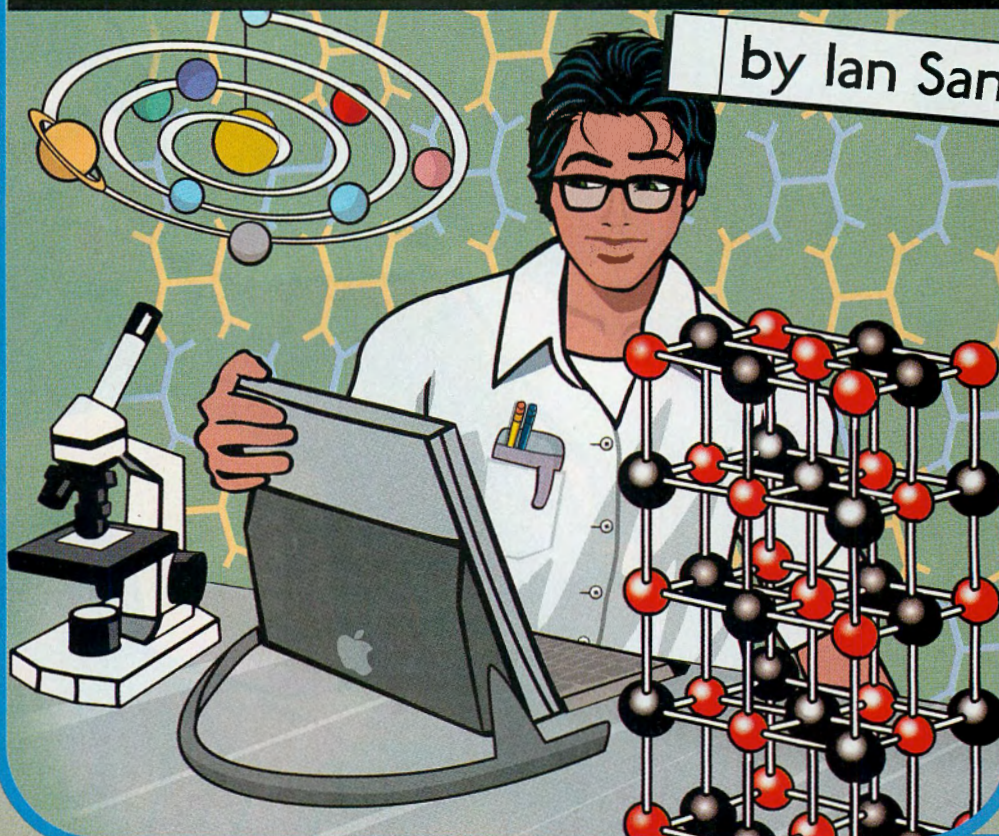


ILLUSTRATION BY STUART PATTERSON

**A**lthough it's handy to keep around, a conscience can be a pesky thing. There you are, about to show the world that you're easily the best coach in the history of football (or at least in the history of Madden 2000), when a little chirping voice in your head wonders just when you're planning to squeeze some real work into your busy schedule of dawdling and procrastination.

While it's tempting to crush that pesky cricket (or at least start hammering away at Ambrosia's latest, hoping to send it as an appetizer to Jason Whong), there's an alternative to life as a conscienceless sociopath or as a humorless workaholic drone. A slew of applications that are vastly

entertaining (from a sufficiently geeky perspective) also have a reasonable claim to being educational, thus keeping the irritating pangs of your nearly moribund work ethic at bay. After all, you're not just wasting time—you're learning math and science (in theory, anyway)!

Before you read further, be advised that the key phrase here is "a sufficiently geeky perspective"—if you can't even stand the thought of science, you'll find these apps as entertaining as a long, slow tax audit. Assuming that the ungeeky have gone off to work on some 20-minute projects, let's take a look at the cream of the current crop of Mac-based techie toys.





# PHYSICS

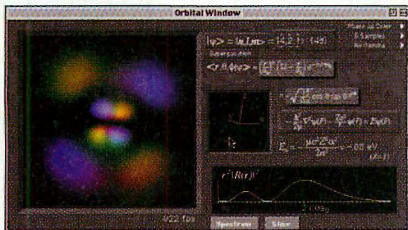
## Atom in a Box

Dean Dauger

<http://www.physics.ucla.edu/~dauger>

\$20

Dean Dauger is the current master of physics shareware, and Atom in a Box is possibly his finest creation. This deceptively simple program plots the electron cloud around a hydrogen atom. The various wave states of the



**ATOM IN A BOX lets you rotate this beautiful representation of an f orbital so you can examine it in three dimensions.**

electron are stunningly beautiful, but the amount of mathematics required to understand them is daunting. This program does the math for you, allowing you to gain at least an aesthetic appreciation of the wave states. It's certainly not enough to get you through a sophomore-level quantum mechanics course, but at least you'll see the lovely shapes involved. An option to View Phase As Color offers help to physics students who want to see what's going on—for others the view just makes a pretty image prettier. If you'd rather play games, type "atomwars" to get one of the coolest Easter eggs we've seen.

## Fresnel Explorer

Dean Dauger

<http://www.physics.ucla.edu/~dauger>

Postcardware

Imagine a tiny ball lamp, emitting only a single wavelength of light. Imagine an object in the path of the light emission, near the lamp itself. If light weren't a wave, you'd see a simple shadow on a screen placed beyond the obstruction. Try this experiment in the real world, though, and you get a beautiful set of fringes as the light takes various paths around the obstruction, interfering with itself. The mathematics behind these phenomena is somewhat intractable (intractable is math-speak for "really, really hard to do").

**IF YOU CREATE YOUR SETUP CAREFULLY ENOUGH, you can recreate this sort of pattern at home. Just shine a cheap laser pointer through a pinhole aperture, then place a round obstacle in the path of the emerging light.**

Dean Dauger came up with a clever way to solve the math quickly on his Mac, which led to a very cool program. Fresnel Explorer can generate the patterns you'd see if you conducted the experiment described above—and their exquisite beauty offers a rare pleasure.



## MPj Astro

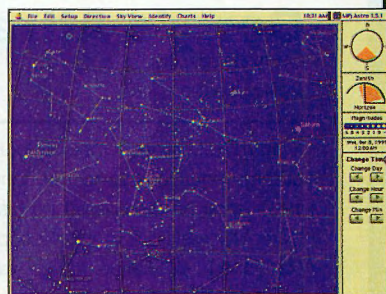


Microprojects

<http://www.total.net/~mpj>

\$25

If you're looking for a traditional planetarium-type program, MPj Astro is a must. For the amateur astronomer, this program's a blast: It can quickly render star charts for any position and time, including such details as the current positions of Jupiter's four easy-to-spot moons and the configuration of Saturn's rings. It will even help you know when to expect meteor showers.



**WHEN YOU WATCH THE SKIES, MPj Astro tells you exactly what you're seeing.**

## Franklin

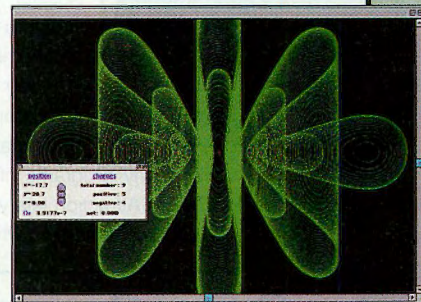


Paul Peters

<http://www.vbe.com/~ppeters/franklin.html>

Freeware

Ever try to visualize the electric field around an  $n=9$  linear multipole? The answer is probably somewhere between "Huh?" and "No!" for the vast majority who have never set their sights on science or engineering. That's a shame—the field describes a beautiful, almost floral shape that looks like an artist's creation, yet has a simple mathematical origin. Franklin gives the nonscientist a peek at what scientists, mathematicians, and engineers are talking about when they describe the beauty of mathematics.



**ADMIT IT—even if you hate physics, this is simply gorgeous.**

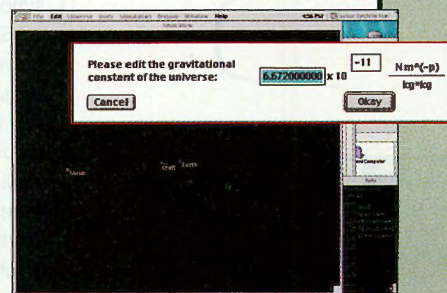
## Solar System Sim

Dean Dauger

<http://www.physics.ucla.edu/~dauger>

\$20

With full texture-mapping support and an elegant look, Solar System Sim lets the user build a solar system, then simulate its life cycle. Building new solar systems with this program can be a bit tricky (a copy of CRC's *Handbook of Chemistry and Physics* wouldn't hurt), but the stunning graphics and relatively deep set of options make this program a wonderful toy. A lot of thought has gone into it—even the starry background is accurate, and you can use it to orient yourself.



**YOU'VE GOT TO LIKE ANY PROGRAM that puts up a dialog box like this one.**





# MATHEMATICS

## Gerry's Attraction

Gerry Beggs  
Postcardware

Edward N. Lorentz, a meteorologist, was using a relatively simple set of three equations to model convection in the atmosphere around 1963 when he discovered (to his surprise) that the equations were extremely sensitive to initial conditions. Tiny variations in where he started the simulation led to vast differences in its evolution. In an attempt to figure out what was going on, Lorentz plotted his

**HERE'S THE LORENTZ ATTRACTOR from an unusual, side-on perspective.**

system's evolution over time, and found that despite the sensitivity to initial conditions, it tended to describe a definite shape. Lorentz called this shape a "strange attractor" and began to study its properties, heralding the field that's been popularized as *chaos theory* for the last decade.

Gerry's Attraction gives the user a good look at two of the most famous strange attractors: the original Lorentz Attractor and the Rossler Attractor (a beautiful, fountainlike structure that arose from Otto P. Rossler's work on chemical kinetics). The program traces up to 5,000 points following either set of equations, from an initially random scatter to their final organized flow in one or the other attractor.

As with many programs of this ilk, the results are amazing to behold. Gerry's Attraction lets you wander freely about the attractor (as if you had encountered it while playing Marathon).

## SuperGraph

Mike Epstein  
<http://www.bozosoftware.com/supergraph>  
\$15

When we first decided to compile a list of the best shareware science apps, we weren't going to include any graphing programs. So many of these apps fail to reach even the standard of the Mac OS's Graphing Calculator that we thought the category simply wasn't worth covering.

SuperGraph was the first product to prove us wrong. It's a very unusual beast: Instead of plotting the equation you type in, it shades each point on the graph according to how close to an equation solution it is. SuperGraph can therefore plot many equations that can't simply convert into the  $y=f(x)$  form most graphing programs require. The program correctly plots  $x^2+6y^2=1$  as an ellipse,

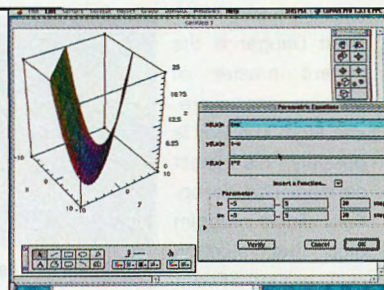
**THAT'S RIGHT, IT'S NOT A FUNCTION! SuperGraph lets you plot equations not easily expressed as  $y=f(x)$ .**

without cutting off the bottom half as most programs would. SuperGraph is a wonderful toy for a student taking an analytic geometry course, as well as anyone who just wants to see what his or her math looks like.

## Curvus Pro 1.3.1

Arizona  
<http://www.curvuspro.ch>  
\$40

Whereas SuperGraph performs an unusual type of graphing well, Curvus Pro does pretty much everything else well. Curvus Pro is the Popeil Pocket Fisherman of graphing programs—you name it, Curvus does it. The program supports almost every type of graph that ever



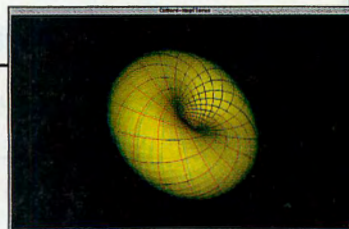
**CHECK OUT HOW WE SPECIFIED this surface—you name it, Curvus can plot it.**

kept you up late in a math or science course. This is simply the deepest mathematical plotting program we've ever seen. Those who enjoy torturing defenseless graphing programs (you know who you are—we've seen you late at night trying to confuse the hapless Graphing Calculator) will love this one.

## 3D-Filmstrip

Richard Palais  
<http://rsp.math.brandeis.edu>  
Freeware

The difficulty involved in learning mathematics often hides the beauty that it can describe. Richard Palais's 3D-Filmstrip is a stunning tour of the forms mathematics offers. The layperson may not find all aspects of this program readily accessible, although we think it renders enough beauty to satisfy even the most math-phobic reader.

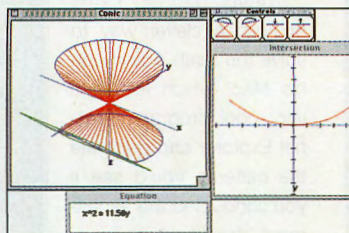


**THIS TORUS (rendered in 3D-glasses form) is only the tip of 3D-Filmstrip's iceberg.**

## Conic Sections

Brian and Aidan Cully  
<http://www.jalacy.com/conics>  
Freeware

This one's a bit simplistic, but it has a certain charm. You can generate circles, ellipses (ovals), parabolas, and hyperbolas by slicing a right circular cone with a plane. This program simulates that action, letting you tilt the plane at will, and plots the resulting curve alongside its equation.



**THIS OUTSIDE SLICE at a 45-degree angle creates a shallow parabola.**





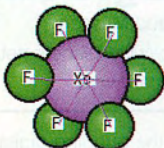
# CHEMISTRY & BIOLOGY

## CHON Modeller

Richard Davies

<http://hyperarchive.lcs.mit.edu/HyperArchive/Abstracts/sci/HyperArchive.html>

\$45

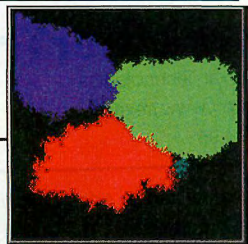


In the real world, the basic chemistry toy is the ball-and-stick model. When you translate these toys into computer format, though, a new dilemma arises—should the program focus on the construction of molecules or upon rendering them beautifully? (Some programs do both, but their price point puts them out of this article's scope). CHON Modeller opts for the former—it lets you construct molecules from their constituent atoms. The user interface is a bit clumsy, but overall CHON Modeller does a good job of simulating an outstanding set of balls and dowels. Be aware that the demo version of CHON Modeller is profoundly crippled—it doesn't let you use carbon, hydrogen, or silicon.

**OK, WE ADMIT IT—XeF<sub>6</sub> isn't your run-of-the-mill molecule. It's tough to avoid C, Si, and H!**

## Petri Dish

Aaron Golden  
Freeware

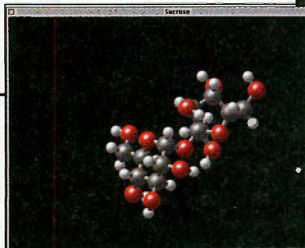


Petri Dish simulates the growth of competing bacterial colonies. The program is extremely simple: To start a colony, just click in the petri dish. The program shouldn't be as entertaining as it is, as user interaction is limited to starting new colonies. Nevertheless, Petri Dish is strangely mesmerizing—the colonies grow and compete just quickly enough to make the process interesting. This is a great program to stare at when you're out of ideas.

**THE CYAN COLONY in the lower right of the cluster got a late start—it'll have trouble surviving in the face of the stronger green and red colonies.**

## MacMolecule 2 Lite

Molecular Ventures  
<http://www.molvent.com>  
Freeware



**SWEEEEET!**

At the other extreme of the molecular-modeling spectrum, MacMolecule 2 Lite gives you stunningly rendered molecules but no construction tools. Instead, it relies upon the standard Protein DataBank format (PDB) for its information. Since the Internet offers vast repositories of PDB files (see <http://www.rcsb.org/pdb> for one of the biggest), this isn't much of a restriction in practice, as long as you don't actually want to build molecules yourself. If you're determined to fiddle, Molecular Ventures has a full specification of its native file format on the Web, so the truly geeky can fire up BBEdit and start building molecules.

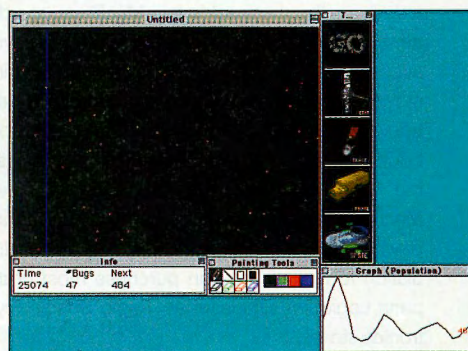
## Prokaryote

Adam Wight

<http://hyperarchive.lcs.mit.edu/HyperArchive/Abstracts/sci/HyperArchive.html>

\$10

Kansas State School Board members may not want to read this one: Prokaryote is a simple but oddly compelling simulation of evolution in a species of organisms. At first, random "programs" specify the organisms' movement, but as time passes and the food supply drops off, only those prokaryotes with the best programs survive to breed new generations. You can put up barriers to create distinct populations, as well as lay down poison to give the creatures more to worry about. On a G3 or G4, many generations pass in a matter of minutes—it's oddly relaxing to watch the progression from the almost random paths of early generations to the long streaks of later, better-adapted ones.



**AFTER ONLY THREE GENERATIONS, the prokaryotes have become noticeably more clever at getting their food.**

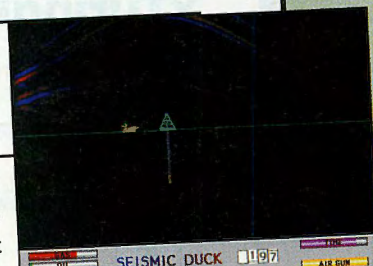


# GEOLOGY

## Seismic Duck

Arch D. Robinson  
Freeware

Seismic Duck (named for Edwin Drake, the first person to drill for oil) lets you enjoy the fun parts of underwater oil exploration without any of the risks that accompany it. You play a duck with an air gun (who hasn't enjoyed the thought of being a well-armed waterfowl?), facing the task of drilling for oil trapped in the layers of rock below your lake. Watch for the reflections of seismic waves from your air gun and try to figure out where the high parts (anticlines) are located in the underground aquifer. Drill into the right spots, and you're rewarded with gas and oil! Just as in the real world, drill too many dry wells and you're out of money and out of luck. You can vary the complexity of the geology to match any skill level, beginner to master.



**OIL! OUR PLUCKY WATERFOWL has struck it rich by interpreting the reflections of its air gun. The game gets much, much harder than this!**

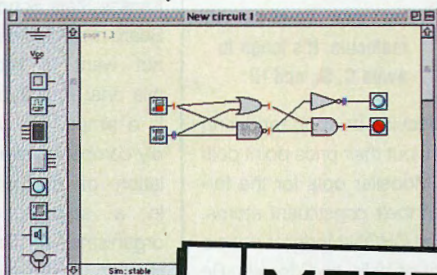


# ELECTRONICS & COMPUTER SCIENCE

## MacBreadboard

YOERIC Software  
<http://www.yoeric.com>  
 \$50 commercial

If you've never tinkered with electronics, a "bread board" is a circuit board with a grid of sockets mounted on it that lets you quickly build a device without any soldering. MacBreadboard is an outstanding digital simulator that gives you access to digital chips for designing and building simple devices. If you're totally new to digital electronics, stop by your local library and pick up a book first—the program assumes at least a passing familiarity with the chips it simulates. MacBreadboard's sometimes daunting realism pays dividends when you want to move from simulation to reality: You can purchase most of the parts LogicSim simulates at Radio Shack, Fry's, or other electronics stores.



## LogicSim

Arnaud Masson  
<http://www.planete.net/~amasson/logicim.html>  
 Postcardware

For the budding digital designer, LogicSim is a bag chock full of virtual Legos. LogicSim gives you all the basic components to build anything from a simple adding machine to a full-fledged (if somewhat underpowered) computer. You can use smaller projects as components in larger ones. This one's almost too cool.

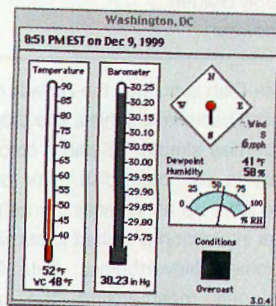
**THIS IS ABOUT AS SIMPLE a calculator as you can imagine—it adds two bits, without even the shave or haircut.**

# METEOROLOGY

## WeatherTracker

Trexar Technologies  
<http://www.trexar.com>  
 \$24.95

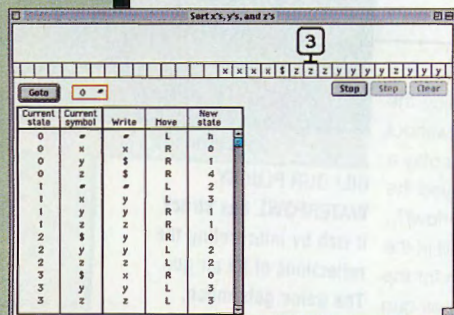
WeatherTracker does exactly what it says: quickly downloads and reports weather conditions almost anywhere in the world. WeatherTracker reports on temperature, wind, barometric pressure, humidity, and cloud conditions. This program might be useful for the extremely mobile road warrior; for the rest of us it's just a really cool toy.



**WHILE TRAVELERS MAY FIND IT USEFUL, WeatherTracker is a supremely cool toy.**

## xTuringMachine

David Eck  
<http://math.hws.edu/TMCM/DownloadingInfo.html>  
 Freeware



**THE PROGRAM (part of which you can see in the lower left) makes the Turing machine sort a list of x's, y's, and z's.**

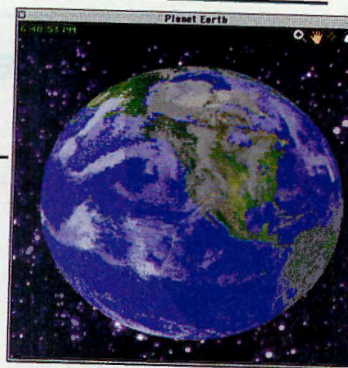
In 1936, the legendary Alan Turing proposed the Turing machine, a simple tape-based computer that he said could prove theorems defining what computers could and could not do. xTuringMachine (originally developed to supplement Eck's *The Most Complex Machine*, AK Peters, 1995) lets you build your own Turing machines (the site provides a number of simple ones to get you started).

*Ian Sammis is MacAddict's resident International Man of Matter.*

## Planet Earth

Lunar Software  
<http://www.lunarsoft.com>  
 \$15

Planet Earth plots the globe and the current cloud cover (downloaded from the Web) in real time. You can then spin the globe by hand to see a particular country, or just let it spin by itself. Leave this program open in the corner of your desktop all day long so you can watch Earth spin your building away from the sunlight and into darkness. With the exception of a somewhat silly background of stars (it's disconcerting to have the stars stay still as you spin Earth in an instant of time, since the sun's quite obviously rotating), Planet Earth's a lot of fun.



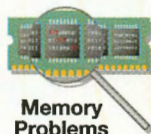
**ANYONE WHO DOESN'T THINK THE MACADDICT STAFF works hard enough should note the position of the day/night terminator.**



# The Seven Deadly Macintosh Sins:



Software Conflicts



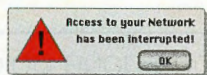
Memory Problems



Viruses



Hardware Problems



Network Problems



Disk Damage



Damaged Software

## Salvation:



When good Macs go bad and fall from grace, it's good to know there's help nearby. Salvation is only a mouse-click away with the new TechTool Pro 3. Now featuring virus protection and conflict detection, TechTool Pro is the only program you need to help abolish the evil forces that have possessed your Macintosh. TechTool Pro 3 checks more aspects of your Macintosh than any other utility available. Period. Besides repairing and recovering damaged drives, eradicating viruses and catching the occasional software conflict; you can also test all those other critical parts of your system that other utilities simply ignore. Like RAM, logic board components, floppy drives, scanners, modems, internet connections and so much more. TechTool Pro even supports technologies like System 9.0.1, "Pure" HFS+, Firewire and USB drives, and all of the latest Macintosh models.

TechTool Pro can also help you in between times of trouble. Our disk and directory optimize features can help

improve the performance of your Macintosh as well as help circumvent problems before they happen. The TechTool Protection control panel will regularly check your system so you don't have to. It will also back up critical directory data, so if something goes wrong, you'll be up and running in no time flat.

But just because TechTool Pro is the most advanced Macintosh troubleshooting utility available doesn't mean that it has to be difficult to use. Our easy-to-use interface makes checking and fixing your Macintosh as easy as pressing one button. For advanced users, expert access allows you to control and configure TechTool Pro in almost any way you wish.

So if Macintosh troubles are turning your life into a living Hades, check out the tool of the trade: TechTool Pro. After all, you have the most powerful computer in the world. Shouldn't you be using the most powerful utility?

**Purchase TechTool Pro 2 now and receive a free upgrade to TechTool Pro 3 when it ships in Q1 2000!**

**See us at MacWorld Expo 2000 in San Francisco. Booth 3334**

MicroMat Inc.  
800-829-6227  
707-566-3831  
FAX: 707-566-3871  
info@micromat.com  
www.micromat.com



Fix different.™







# reviews

Over the rainbow lies a pot of Mac goods gone gold.

## 450MHz Power Macintosh G4

### HARDWARE

**COMPANY:** Apple

**CONTACT:** 800-538-9696 or 408-996-1010, <http://www.apple.com>

**PRICE:** \$3,079 for this particular machine (prices vary, see below)

**SPECIFICATIONS:** 450MHz G4, 256MB of RAM (1.5GB maximum), 20GB hard drive, DVD-ROM drive with DVD-Video, Zip drive, 16MB Rage 128 video card through AGP 2X slot, three FireWire ports, two USB ports, built-in support for Airport

**NOTHIN' FRUITY** to look at here.

Apple uses the word *Yikes* as a code name for one of the two different G4 motherboard designs, but it actually works well as an adjective for the entire G4 sales strategy. The company has had some dizzying pricing and model confusion before; however, its handling of the G4 line is a real milestone in boneheadedness for Apple.

Here's the deal: The G4 line of Macs initially included two different motherboards, both of which at one time or another offered

350MHz and 400MHz options. The lower-end motherboard has basically the same design as the G3 motherboard, and Apple has essentially discontinued it (though a few still remain in stores). The upper-end motherboard (an all-new design) comes in 350MHz, 400MHz, 450MHz, and 500MHz flavors, but Apple has



PHOTOGRAPHS BY AARON LAUER

**WE FIRST LOOKED AT THE G4** and all its pricing configurations in the November 1999 issue—but things change. We've updated our chart to show you Apple's current offerings.

## AT A GLANCE? Your Guide to the G4 in Easy Bites

UPDATED

### 350/MHZ

THE 350MHZ POWER MACINTOSH STILL PACKS QUITE A PUNCH.

**PROCESSOR:** 350/MHZ G4  
**MEMORY:** 64MB (1.5GB MAXIMUM)  
**MEMORY BANDWIDTH:** 800 MBPS  
**GRAPHICS:** RAGE 128 IN AN AGP 2X SLOT  
**DRIVES:** 10GB ULTRA ATA/66 HARD DRIVE, DVD-ROM DRIVE  
**CONNECTIVITY:** 10/100BASET ETHERNET, THREE FIREWIRE PORTS, TWO USB PORTS, INTERNAL 56-KBPS MODEM  
**PRICE:** \$1,599

### 400MHz

Based on the blue-and-white G3 motherboard design, the 400MHz Power Macintosh still packs quite a punch.

**Processor:** 400MHz G4 with 1MB of backside cache  
**Memory:** 64MB (1.5GB maximum)  
**Memory bandwidth:** 800 MBPS  
**Graphics:** Rage 128 in a special 60MHz PCI slot  
**Drives:** 20GB Ultra ATA/66 hard drive, DVD-ROM drive, ZIP DRIVE  
**Connectivity:** 10/100BaseT Ethernet, three FireWire ports, two USB ports, internal 56-Kbps modem  
**Price:** \$1,599

### 450MHz

The low end of the new motherboard design, the 400 REPRESENTS THE MIDDLE OF THE G4 FAMILY.

**Processor:** 450MHz G4 with 1MB of backside cache  
**Memory:** 256MB (1.5GB maximum)  
**Memory bandwidth:** 800 MBPS  
**Graphics:** Rage 128 in an AGP 2X slot  
**Drives:** 20GB Ultra ATA/66 hard drive, DVD-ROM with DVD-Video playback, 100MB Zip drive  
**Connectivity:** 10/100BaseT Ethernet, three FireWire ports (one internal), two USB ports (with individual controllers, allowing more USB devices and 24 MBps of bandwidth), internal 56-Kbps modem  
**Price:** \$2,499

### 500MHz

NOT YET AVAILABLE

This is the hottest of the hot. Powered by the very fastest processor of this racy bunch, the 500MHz offers even more than the 400MHz version.

**Processor:** 500MHz G4 with 1MB of backside cache  
**Memory:** 256MB (1.5GB maximum)  
**Memory bandwidth:** 800 MBPS  
**Graphics:** Rage 128 in an AGP 2X slot  
**Drives:** 27GB Ultra ATA/66 hard drive, DVD-ROM with DVD-Video playback, 100MB Zip drive  
**Connectivity:** 10/100BaseT Ethernet, three FireWire ports (one internal), two USB ports (with individual controllers, allowing more USB devices and 24 MBps of bandwidth), optional 56-Kbps modem  
**Price:** \$3,499



## What the Heck Do I Own?

Apple's official solution for determining which G4 motherboard you have is to examine the speaker and microphone jack configuration on the back of the machine. If they are organized horizontally, you have the low-end motherboard, which Apple calls the PCI Graphics G4. If they are configured vertically, you have the new motherboard—the AGP Graphics G4.

never shipped the 500MHz option. When Apple launched the G4, this model was expected to head the lineup, with a price of about \$3,500. Since the 500MHz is no longer available (or not yet available, depending on how you look at it), the 450MHz model is the current top of the line, and it costs \$3,500 packaged with a DVD-RAM drive and a 27GB hard drive. When we got our test machine, though—sans DVD-RAM and with only 7GB of hard drive space—the 450MHz model cost just \$2,500. See what we mean? *Yikes!*

What is clear, though, is that all the G4 Macs sport a sleek, refined graphite color scheme, and possess a speedy new processor—the G4. This processor's big boon comes from a new architectural addition, which Apple dubbed the Velocity Engine (Motorola calls it AltiVec). The new unit can process certain computations (mostly related to graphics and imaging), freeing the main processor for other tasks. Motorola and Apple claim the Engine increases the speed of some functions up to 60-fold (though we have yet to see any results nearly that dramatic), but you need apps written specifically to take advantage of it. The Velocity Engine gives the G4 its much-ballyhooed "supercomputer" status, which according to Apple prevents export to certain "hostile" nations.

Marketing hype and confusing system options aside, the G4 (any model) is only a



mild (if elegant) step up from its G3 predecessor, which hit the market a year ago. In performance benchmarks, the G4 was around 30 percent faster than a 400MHz G3 in non-Velocity tasks, and about 55 to 70 percent faster in Velocity-enabled functions, specifically Photoshop 5.5 filters and SoundJam MP encoding. Gone are the days when the Mac doubled its speed over the course of a year—not that we *need* that much speed, mind you. We just like to know we have it.

One aspect of the G4 outclasses other models significantly—the 2X AGP graphics slot. The G3, and the low-end motherboard of the early G4s, featured a modified PCI slot instead of a true AGP slot. Like USB and FireWire, AGP is a cross-platform standard, so with Mac-specific drivers you can use the PC hardware that plugs into the new Mac video port. In the near future, we should start seeing traditionally PC-only video cards, such as 3dfx's Voodoo series, working on the G4. 3dfx has already posted beta drivers for its Voodoo3 board (<http://www.3dfx.com>). AGP is also faster than Apple's previous PCI implementation. Even with

similar video cards, the G4 performed 38 percent faster than the G3, according to the Norton Utilities System Info video test.

Like any brand-new piece of hardware, the G4 has a few bugs and blips. One of these has certainly upset video makers eager to get the Velocity Engine's power

## What the Heck's the Difference?

Other than the difference in graphics systems (AGP versus PCI), the difference between the two G4 motherboards is subtle. The AGP model also features built-in Airport support, fine-tuned USB and FireWire, an internal FireWire jack, a faster internal hard disk interface (ATA/66 instead of ATA/33), and a different internal modem and Ethernet setup.

behind their editing tasks—thanks to changes in FireWire implementation, almost every FireWire video application seems to have problems, including Apple's own Final Cut Pro. Apple plans to release an update to Final Cut, and other FireWire video app makers such as Digital Origin are likewise working on fixes, but we don't recommend that video editors upgrade to the new Macs until they know their app of choice works. For a list of reported problems, fixes, and general gripes, check MacFixIt (<http://www.macfixit.com>).

The G4 is certainly not a requisite upgrade for anyone who recently acquired a G3. Also, the price system and model switching have caused a level of confusion and frustration that detracts somewhat from the machine's appeal. We have to say, though, that the G4 is a very solid, cool-looking Mac. Apple appears to have all its ducks in a row at last with the G4—prices have stabilized overall, and Apple has streamlined the available motherboard's price to just one figure. If you're in the market for an all-new Mac, and you want a little more juice than an iMac offers, go ahead and get a G4. It's a killer machine.—Robert Capps

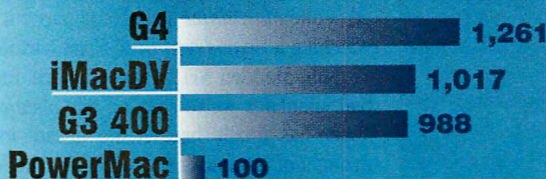
**GOOD NEWS:** Fast. Real AGP. Sleek graphite color.

**BAD NEWS:** Non-Velocity Engine computing only slightly faster than year-old G3s. Suffers from pricing and model disarray.



## NORTON UTILITIES SYSTEM INFO OVERALL SYSTEM RATING

Bigger is better.



\* Reference system: PowerMac 6100/60

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# reviews

reviews

## Madden NFL 2000

FUN & GAMES

**COMPANY:** Aspyr Media

**CONTACT:** 512-708-8100, <http://www.aspyr.com>

**PRICE:** \$49.95 (SRP)

**REQUIREMENTS:** 180MHz 603e (200MHz recommended), System 7.5.3 or later (7.6.1 or later recommended), 32MB of RAM (64MB recommended), 106.5MB of hard disk space, 4X CD-ROM drive (8X recommended)

**B**efore we start our review of Madden NFL 2000, let's just take a moment to revel in the simple fact that a commercial football simulation has been released for the Mac. This may not seem like a vast step, but remember that the last such program, XOR Football, pitted teams of plucky Xs and Os against one another on a one-bit gridiron with player interaction limited to calling plays.

Fortunately, Madden NFL 2000 is among the best football simulations currently available on any platform—console or coin-op. The game offers spectacular depth—you can do anything from practicing a specific play until you're satisfied with it to coaching a franchise until the owners fire you (or until the end of 30 seasons, if you last that long). If you really get into the game, you can

set audibles, create your own plays and playbooks, and even trade players.

Rich, detailed gameplay is Madden's real strength. This isn't the simplified, seven-man football presented by NFL Blitz, Cyberball, or so many other games. Here, full teams of 11 players compete on a field that (almost uniquely among computer football simulations) accurately represents the 100-yard field's enormity. Play-by-play commentary by John Madden and Pat Summerall generally manages to be both accurate and relevant, with occasionally hilarious glitches (in particular, Madden sometimes comments that the offense should have gone for a field goal, after they've already tried...and failed).

Madden NFL offers increasing levels of complexity, from a somewhat absurd Arcade mode up to a full Franchise mode. Arcade mode removes so many of the game's intricacies that what's left scarcely seems worth playing. In Exhibition mode, one or two players play a simple game with no real context. In Season mode, players compete throughout an entire season, from the initial

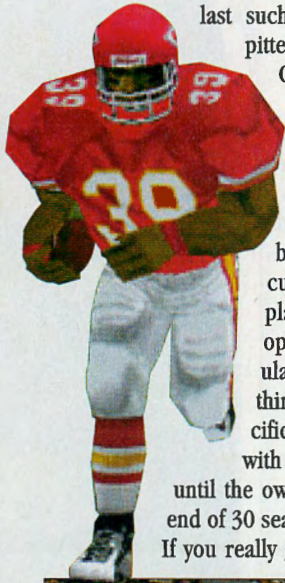
commentary by Madden and Summerall to the end of Superbowl Sunday. Football fanatics can try Franchise mode, where you control a team for 30 seasons (provided you keep winning). Franchise mode lets you make trades, resign players and hire free agents, pick players in the NFL draft, and generally exercise total control over a team.

The game's greatest weakness is its appalling interface, a holdover from the game's debut on console machines. Even an outstanding console interface feels clunky on a Mac with a mouse and keyboard. The game also has a rich and interesting variety of crashing bugs (Aspyr expects a forthcoming patch), network play between Mac and Windows versions isn't possible, and the control set (originally designed for the PlayStation's button-encrusted controller) tends to crush lesser joysticks.

Madden's graphics are typical of the current crop of 3D games: The graphics are detailed—even the folds where the players' jerseys' hang loose are clearly visible. Madden can display at resolutions up to 1024 by 768, but the increase in detail wasn't worth the performance hit on our 400MHz blue-and-white G3. While the animation is smooth enough not to interfere with the game, it remains somewhat stilted—one *MacAddict* staffer compared it to watching a *Beavis and Butt-Head* cartoon.

Still, Madden NFL 2000 is the best football simulator we've seen on any platform. Aspyr has finally broken the decade-long drought of Macintosh sports games, and has done it in fine style. Let's hope the release marks a new trend. We'd rather not wait another decade to see more fine sports games on the Mac.—*Ian Sammis*

THIS PASS DIDN'T GO so well for the Chargers—it was picked off.



A FEW SECONDS AFTER THIS 53-YARD pass, the Chargers scored a touchdown.

**GOOD NEWS:** Exists for the Mac.

Outstanding football simulation.

**BAD NEWS:** Weak interface outside the football games. Buggy.







## Canvas 7

### DESIGN & GRAPHICS

**COMPANY:** Deneba

**CONTACT:** 800-622-6827 or 305-596-5644,

<http://www.deneba.com>

**PRICE:** \$375 (SRP)

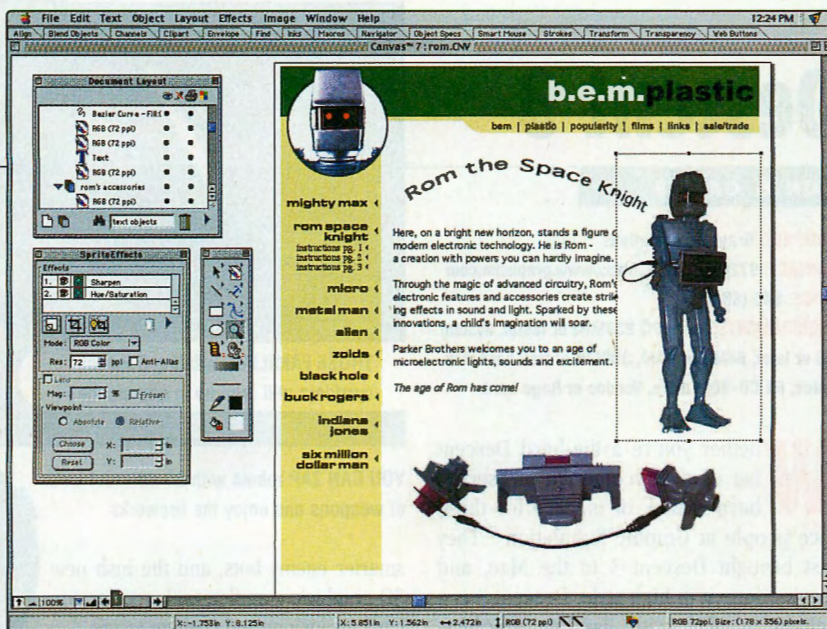
**REQUIREMENTS:** Power Macintosh, Mac OS 8.5 or later, 32MB of RAM, 80MB of free hard disk space, 800 by 600 or higher screen resolution, 2X CD-ROM drive

Deneba has positioned Canvas as an all-purpose graphics and publishing tool—ready to take on any page layout, vector illustration, bitmap editing, or Web publishing project. The problem with multi-function packages is that they're often much weaker than the sum of their parts. Canvas 7 avoids this pitfall by introducing enough performance enhancements, features, and brand-new Web publishing capabilities to satisfy graphic artists who want to do it all.

We took Canvas through a grueling test drive, designing a Web site and promotional flyer without ever leaving the app. We created the art as vector graphics, converted them to GIFs, wrote copy, sliced images, and exported the entire project as a six-page site. For print, we took the site's first page, used our vector art to create higher-resolution imagery, and output a sharp-looking flyer on a color laser printer with high WYSIWYG fidelity.

The results impressed us. As a bitmap editor, Canvas delivers a lot of the same functionality as Adobe Photoshop—from support for alpha-channel masks and blending, to setting white and black levels. You can also set transparency levels and apply Photoshop-like filters to vector art, which remains editable. Canvas 7 is also a strong vector art tool, offering total control over Bézier curves with new Auto Curve, Reshape, and Push functions. After creating the art, use Canvas as a page-layout program, with multiple masters, column guides, text wrap, linked column flows, headers and footers, and text on curves.

The quality of its bitmap, vector, and layout tools alone would justify a high rating, but Canvas 7 has added Web-publishing features that really push it over the top. Once you've built a page, a simple export command can output it as HTML, compressing and saving graphics for the Web in an image directory. The HTML isn't up to the standard of a hand-coded page, but it easily matches the output

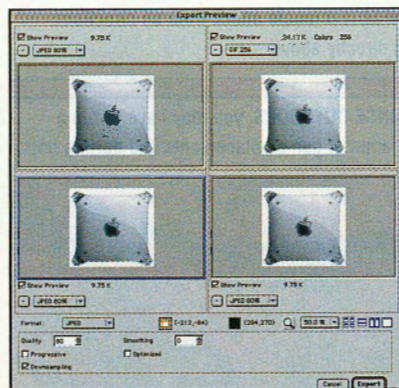


**WE USED CANVAS 7'S FULL RANGE OF TOOLS to put together this Web page and print brochure.**

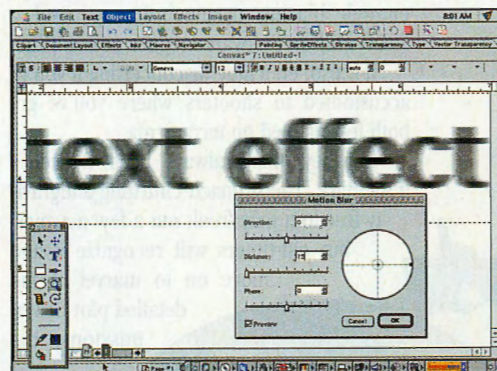
from Macromedia's Dreamweaver or Adobe's GoLive. Like Adobe's ImageReady and Macromedia's Fireworks, Canvas offers a four-up preview window to control format and compression settings for Web graphics—and goes one step further, adding full FTP support.

Sprite Layers, introduced in Canvas 6, has matured significantly. Roughly analogous to Layer Masks in Photoshop 5.5, it combines standard layer functionality and robust transparency controls. The completely new Sprite Effects technology offers nondestructive editing of bitmaps, vector art, and type on an object level. Even after you've applied a sequence of Photoshop-style filters and distortions like Motion Blur and Emboss to a line of type, you can edit it and retain the added effects.

Canvas has undergone a dramatic interface improvement, putting the vast majority of



**PREVIEW WEB GRAPHICS** in a comparative output window that gives you control over compression settings and output format.



**SPRITE EFFECTS WORK LIKE PHOTOSHOP FILTERS—you can apply them to any object, including text or vector graphics, and still edit the object without losing the effect.**

its daunting range of tools into a tabbed bar that offers instant access to brush palettes and view commands. You can pull the tabs to position palettes for convenience, then simply send them back to the bar when you're done.

Deneba has transformed Canvas 7 from a simple suite of tools into a high-quality production environment. If you're already using Quark, Photoshop, and Illustrator, you won't want to switch. However, if you're looking for software to handle brochure or flyer layout, flat-file Web development, bitmap editing, and vector illustration, Canvas 7 does almost everything the venerable desktop trio will do, for a quarter of the price.—Rick Sanchez

**GOOD NEWS:** Object-based effects.  
Direct FTP access to servers.  
**BAD NEWS:** Daunting interface.  
Immature Web publishing tools.



FIND A TRIAL  
of Canvas 7  
on The Disc.





# reviews

reviews

## Descent 3

FUN & GAMES

**COMPANY:** Graphic Simulations

**CONTACT:** 972-386-7575, <http://www.graphsim.com>

**PRICE:** \$45 (SRP)

**REQUIREMENTS:** PowerPC 233MHz or faster, System 8.0 or later, 64MB of RAM, 300MB of free hard disk space, 6X CD-ROM drive, Voodoo or Rage card

**W**hether you're a die-hard Descent fan or a newcomer to the series, burn a stick of incense for those nice people at Graphic Simulations. They just brought Descent 3 to the Mac, and they've done it in high style. Descent 3 is a delight to play, with dazzling graphics, unfettered 360-degree movement, and enough blazing pyrotechnics to rival a \$200 million Schwarzenegger action film.

It's also, er, a little disconcerting if you're accustomed to shooters where you've got both feet planted on terra firma.

But hey, that's always been Descent's trademark. The stomach-churning antigravity freedom may freak out a few newbies, but old-timers will recognize it and move on to marvel at the detailed plot-driven missions, the



THOSE FAMILIAR, twisting Descent corridors still crop up in abundance.

YOU CAN ZAP robots with 20 different kinds of weapons and enjoy the fireworks.

smarter enemy bots, and the lush new 3D graphics, complete with accelerator-card explosions and flashing lasers.

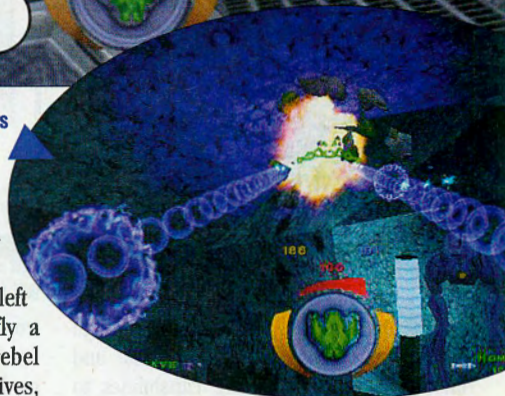
Descent 3 starts where Descent II left off. You're a mercenary asked to fly a zero-gravity ship to save or destroy rebel installations. To reach your objectives, you'll fight your way through swarms of once-friendly, clever robots, now infected with a nasty virus. They come at you singly or in groups—some blast away in the open, while others hide behind corners and snipe.

You'll have your choice of weapons, from laser and plasma cannons to frag and mega missiles. You'll also have a friendly GuideBot to help you locate well-hidden objectives.

Weapons and GuideBots aren't enough. To stay alive, you'll have to master a ton of evasive movements. Your ship can go forward or in reverse, up or down, slide or turn to the right or left—often in rapid succession. The manual recommends a joystick, but we found that the keyboard,

VIRUS-INFECTED robots attack from all directions, including directly above.

ONCE OUTDOORS, you may have to run a gamut of gun emplacements and darting bots.



though complex, is a more sensitive control and works better for the purpose.

Descent 3 also offers an innovative new environment: Unlike the earlier versions, it doesn't keep you twisting through claustrophobic tunnels. With the new Fusion engine, you can escape to the surface for some hot fighting. Instead of fighting every battle at close quarters in a cramped tunnel, you'll zoom to the surface, where robots you can't even see rip you from a distance. You'll have to follow the laser trails to find the enemy, zigging and zagging until you're close enough to nail your prey—and that keeps the game interesting.

The game's only weakness is that it gives you an infinite number of lives. When you die—and you will—just press the space bar, and you're back in business.

If you have slow reflexes and a weak stomach, Descent 3 may not be for you. But if you can twitch and shoot with the best of them, and spinning, reeling worlds of color don't turn you green with nausea, this is a fantastic game—maybe one of the best 360-degree action shooters ever to hit the Mac.—*John Lee*

**GOOD NEWS:** Knock-dead gorgeous. Nonstop kaleidoscopic action. Absorbing plot-driven missions.  
**BAD NEWS:** Occasional doses of Dramamine may be necessary.







## Tom Clancy's Rainbow Six

### FUN & GAMES

**COMPANY:** MacSoft

**CONTACT:** 800-229-2714 or 612-249-7600, <http://www.wizworks.com/macsoft>

**PRICE:** \$49.99 (SRP)

**REQUIREMENTS:** PowerPC 604 200MHz or faster (G3 recommended), 64MB of RAM, 275MB of hard disk space, CD-ROM drive (8X CD-ROM recommended), Rage Pro or better 3D accelerator with direct support for Apple's OpenGL



**THE FIRST MISSION IS TOUGH ENOUGH**—with more than one point of entry to the building. Be careful.

It's a very good time to be a Mac gamer. The hardware matches and even betters its PC equivalent in some instances, and the quality and style of modern Mac games have advanced beyond recognition. Today's state-of-the-art games involve light-sourcing, Phong shading, and trilinear mip-mapping. To best enjoy them, you'll need an up-to-date 3D graphics card for playing Quake 3, Unreal Tournament, and yes, Rainbow Six.

Tom Clancy's Rainbow Six is the thinking man's Quake: There's plenty of action here, but you won't get far without planning and strategy. The Rainbow Team is a United Nations-sponsored counterterrorist unit invented by Tom Clancy, author of the novel *Rainbow Six* (soon to be a movie). Six is a military position, usually bringing up the rear of an attack force.

The gameplay is first-person shooter, but the pace is something entirely new. Jumping straight into a mission and blasting indiscriminately will most likely get you killed by machine-gun fire. Before entering a mission, you examine predetermined maps and plans or, better yet, create your own. You can then

**YOUR TEAM MEMBERS ARE WELL ARMED** and more than prepared to back you up in the event of a firefight—but choose them wisely.

plot which team member goes where, and figure out the best way to achieve your objective.

In most games, sending out computer-controlled characters ends in bloody tragedy, but in Rainbow Six, your team members start out a lot smarter than you. They'll usually complete their objectives if given sensible orders. Meanwhile, you can play the hero—barge into a room full of terrorists and blast at everyone except the hostages. The level of difficulty depends on the situation.

The single-player game seems relatively short and easy—but the challenge soon mounts. Once you've tested your skills in the single-player missions, you'll be ready for the online multiplayer action (for up to 16 players), where the game really comes into its own. The wide range of options includes competitive one-on-one death matches and cooperative team-based strategies. Stealth and cunning are still key—in Quake, you can happily take a direct hit to the face with a rail-gun and survive, but in Rainbow Six, a single pistol shot to the head will finish you.

### Weapons of Choice

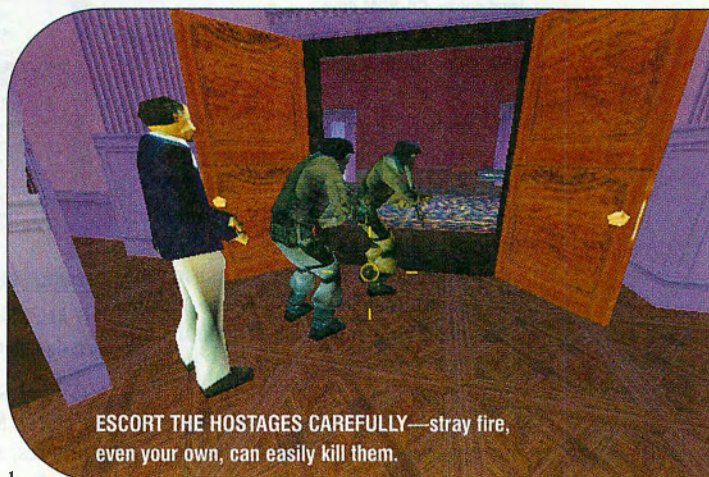
Rainbow Six lets you select the hardware that you and your team carry.

**M16:** Our favorite—accurate and powerful, this gun lets you zoom in on an unsuspecting bad guy and take him out with one shot. Pop.

**HK.45 MARK 23 SIDEARM:** Powerful enough to stop an elephant, but awfully loud.

**BLINDING FLARES:** Baffle and astound opponents while you run in and mop up.

**GRENADES:** As a wise man once said, nothing breaks up a party quite like the arrival of a couple of hand grenades.



**ESCORT THE HOSTAGES CAREFULLY**—stray fire, even your own, can easily kill them.

Rainbow Six has a few technical issues. The game requires some pretty meaty specifications for good performance, and has retained many of the PC version's flaws—clipping errors and occasional problems with the artificial intelligence of team members. More than once you'll curse your "buddies" as they jam up in a narrow corridor and give away your position.

The Mac version is superior to the PC game in a couple of ways. It's easier to install and has a much better interface. The game also comes complete with an extra mission pack (Eagle Watch), expanding the longevity of the single-player game. It's not hard to recommend Rainbow Six. The sheer wealth of options and missions, combined with the timeless multiplayer action and sophisticated gameplay, make it an all-time classic.—*Frank O'Connor*

**GOOD NEWS:** Lots of missions. Great graphics. Plenty of deep, enjoyable strategy. Hefty dose of visceral action. Includes Eagle Watch mission pack and real-time voice capability (requires appropriate headset). **BAD NEWS:** Not as pretty as Quake 3. Occasional hiccups with online and single-player bugs.



**FIND A RAINBOW SIX demo on The Disc.**







# reviews

reviews

## Cubase VST/24 4.1

### AUDIO

**COMPANY:** Steinberg

**CONTACT:** 818-678-5100,

<http://www.us.steinberg.net>

**PRICE:** \$799 (SRP)

**REQUIREMENTS:** PowerPC 604e, 180MHz or faster, Mac OS 8.1 or later, 48MB of RAM, 256MB second-level cache, CD-ROM drive

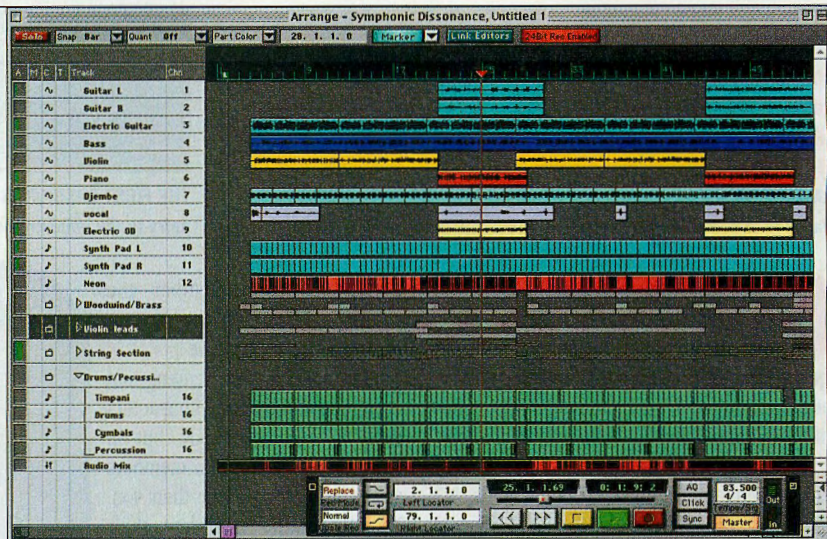
**RECOMMENDED:** Power Mac G3, 266MHz, 128MB of RAM, ASIO-compliant sound card



FIND CUBASE  
VST/24 4.0  
Demo on  
The Disc.

Steinberg has built a loyal following among audio professionals and musicians with Cubase, its integrated digital audio recording and MIDI sequencing package. Cubase allows anyone with a fast computer to create and record music without any external hardware. Users and the press alike have sung praises about its features and capabilities—*MacAddict* included (see *Reviews*, Aug/98, p70). This time we reviewed the latest version in-house—and our reviewer's audio recording package of choice is not Cubase, but its competitor. Can Steinberg maintain its dominance in the digital recording industry with this latest offering? Or is Cubase 4.1 merely a glorified version of its predecessors?

For starters, Cubase VST/24 gets a gold star in the features department based on its sheer volume. It gives you 24-bit, 96kHz digital audio recording capability and allows you to mix up to 96 channels of audio simultaneously, provided you have the processor speed. You also get infinite processing possibilities with Steinberg's VST



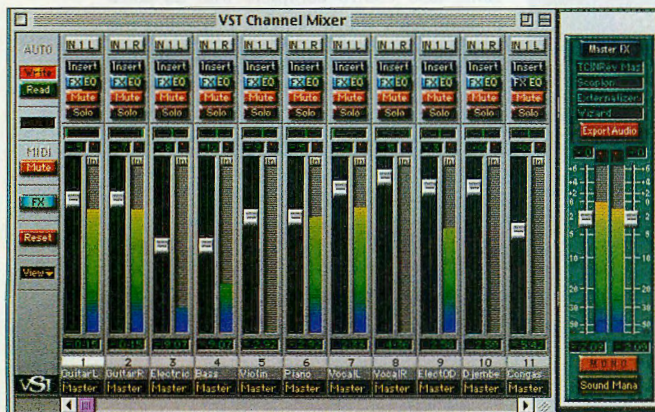
**IT ALL STARTS HERE**—the Arrangement window is where you bring in audio and MIDI tracks and assign them to channels.

(Virtual Studio Technology) plug-in architecture, MIDI recording and sequencing features, score notation and editing tools, waveform editing, automation, and a lot more. Does it deliver? Let's open up this bad boy and see for ourselves!

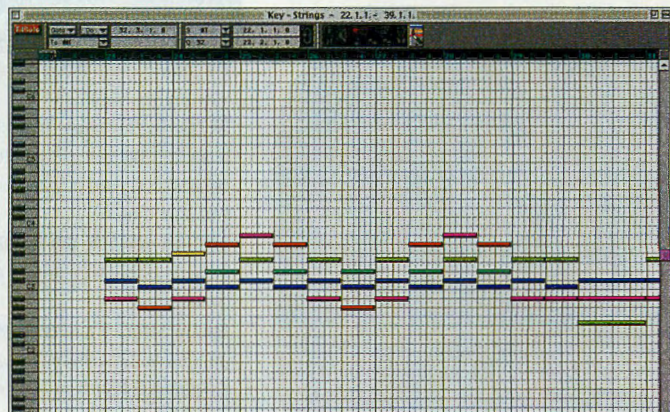
Right away we ran into a snag. Cubase requires a floppy disk authorization key to unlock the program. iMac, G3, and G4 users won't get immediate gratification upon installation due to the lack of a floppy disk drive. Certain USB floppy drives will work if you download a certain patch and upgrade to Mac OS 9. Ours didn't. The only other alternative was to unlock the software by supplying a password *response* to the

Cubase-issued *challenge* via a dialog box. However, to get this response password, you need to copy the challenge, verbatim, onto a registration card and snail-mail it to Steinberg. The company will then snail-mail the response back. Jeez.

Once we had our response and finally got into the program, we were pleasantly surprised. Cubase wins the beauty pageant for its looks—the color, detail, and realistic translation of hardware componentry into a software interface are absolutely stunning. Anyone who's ever operated a multitrack recorder will feel right at home with this interface. The program seamlessly integrates audio recording, MIDI sequencing,



**FLASHING LIGHTS AND DANCING FADERS?** The automated Channel Mixer is better than a Vegas show!



**NO INSTRUMENT? NO PROBLEM.** The MIDI Editor lets you create MIDI parts that can stand up to pro musicians.



score notation, and processing. A panel or window represents each section and displays the controls needed to handle your audio and MIDI data.

We felt confident enough to skip the manual and dive into the program, hooking up a mixer and a MIDI keyboard to a G4. You bring audio and MIDI tracks into Cubase in the Arrangement window. The left portion of the window displays track information, while the right displays the actual tracks as audio waveform bars or MIDI event bars. You can easily copy and paste tracks anywhere in the Arrangement window for quick composing—an especially useful technique for repetitious MIDI parts such as drum patterns. You can also move tracks anywhere in the window. Double-clicking an audio track allows you to edit its waveform directly.

Recording audio is a breeze if you're familiar with recording-console controls. We were a little alarmed by the latency (delay time) in our first recording when we attempted to multitrack record (simultaneously play and record tracks). Clicking the Insert Delay Compensation button in the Audio System Setup window mysteriously fixed the problem, however, and we experienced no other latency problems afterward.

The biggest attraction of version 4.1 is the introduction of the superb VST (Virtual Studio Technology) 2.0. VST works in the same manner as Photoshop plug-ins—the VST plug-ins provide your host program with additional functionality or features, such as effects processing. This upgrade of Steinberg's own VST standard gives plug-ins the capability to transmit both MIDI and audio data from Cubase. What does this mean? For starters, you can plug in the debut of VST instruments and play them directly from Cubase or any host application supporting VST 2.0.

Cubase comes with only one plug-in supporting VST 2.0—Neon, a virtual analog-style synthesizer. While the technology is incredibly promising, the Neon is actually quite weak. We had hoped to hear some fat,

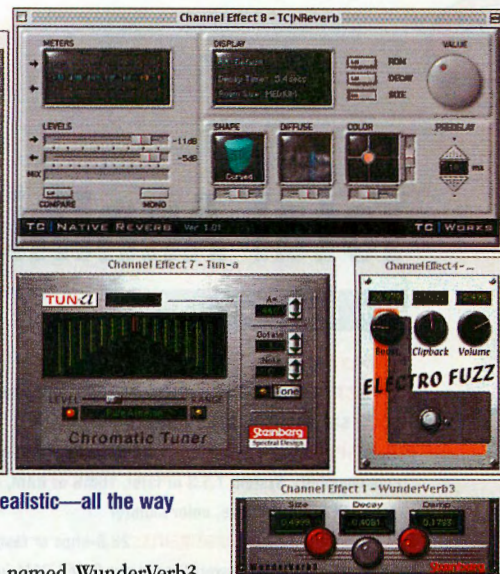


**THE VIRTUAL VST SEND EFFECTS RACK is super-realistic—all the way down to the Power button!**

edgy retro sounds as we played it. Instead, we got a wimpy butter-cream tone reminiscent of granny's organ. We'll give it brownie points for innovation. Thank goodness for third-party developers—we can't wait to see what exciting new plug-ins will come next.

Cubase also introduces its new VST Dynamics section, accessible from the Channel Mixer. It features compression (very nice), gate, and limiting controls—a plus for anyone recording audio without external hardware processors. You access the EQs (equalizers) and VST effects controls from here. Each channel has four parametric EQs with adjustments for gain, frequency, and shelving width, as well as eight Effects Sends. Though VST Dynamics performs nicely, we were a little confused about which knob controlled which EQ and had to consult the manual to figure out this section. Even after consulting the manual, we remained in some doubt.

The VST Send Effects panel is where you choose and edit effects to process your tracks. We were enamored of the interface's true-to-life look and feel—but trying to figure out how to make it work stumped us briefly. D'oh—we needed to turn on the Power button (see the screen shot above). Cubase provides eight effects, including the phenomenal TCNative Reverb, a couple of choruses, a stereo pan, a stereo echo, and the aptly



named WunderVerb3.

Of course, the real beauty of Cubase's VST architecture is the enormous wealth of third-party plug-ins available for it.

We're MIDI-challenged and had to consult the manual on MIDI sequencing, but the "Getting Started" manual didn't get us started (though bribing a friend did). In fact, the printed manual wasn't much help at all. Cubase includes better electronic documentation, though it's awkward to view onscreen with Cubase open. Once we got the hang of it, Cubase's MIDI sequencing capability impressed us with its ease of use. You can literally put together an entire song without a single instrument or the ability to play one thanks to the included OMS (Open Music System) and Apple's QuickTime Musical Instruments. We built an entire orchestra, featuring a dizzying performance from our virtual string section. Try doing that in real life!

The package continued to impress us when we put its automation abilities to work during mix-down as faders danced on their own. The nondestructive editing and quantizing features scored high, too. We even printed out a professional score of our masterpiece.

To sum it up, Cubase VST simply rocks. We like the comforts of our familiar audio package, but we have to admit that Cubase's power, intuitiveness, and beauty wooed us. If you have an older version of Cubase, version 4.1 is definitely worth the upgrade for the VST 2.0 prospects alone. If you're new to digital recording, we highly recommend putting Cubase on your shopping list.—Kris Fong

**SAY HELLO TO THE NEW NEON. No, we're not talking about the four-wheeled variety.**



**GOOD NEWS:** Gorgeous interface. Introduction of VST Instruments. Fully automated mix-downs.

**BAD NEWS:** Floppy disk authorization key. Sparse print manual.







# reviews

reviews

## Total Annihilation Gold Edition

### FUN & GAMES

**COMPANY:** MacSoft

**CONTACT:** 800-229-2714 or 612-249-7600, <http://www.wizworks.com/macsoft>

**PRICE:** \$39.99 (SRP), \$31.95 (street)

**SINGLE-PLAYER REQUIREMENTS:** 150MHz PowerPC or faster (200MHz recommended), System 7.5.3 or later, 16MB of RAM, 40MB of free hard disk space, 4X CD-ROM drive, color monitor

**MULTIPLE-PLAYER REQUIREMENTS:** 28.8-kbps or faster modem or LAN connection, 180MHz PowerPC or faster 24MB RAM (up to 4 players), 200MHz PowerPC or faster and 32MB RAM (up to 8 players), 233MHz PowerPC or faster and 48MB RAM (up to 10 players)



**INCOMING!** Total Annihilation lets you throw your army at the enemy.

FIND A DEMO  
of Total  
Annihilation  
on The Disc.

**T**otal Annihilation is not just another blood-'n'-guts gorefest, no matter what the title and fearsome mechanical warrior on the box suggest. It's an intricate real-time strategy game where fast, furious killing is considerably less important than the tactics you use, and it's really *addictive*.

As the commander of either the Core or the Arm (you choose), you lead an army in the effort to destroy your enemies' commander and win the galactic war. Fight each battle as a separate event in Skirmish mode or as part of a larger saga in Campaign mode. Gold Edition includes the original Total Annihilation game as well as two expansion packs—Battle Tactics and the Core Contingency. With dozens of additional pre-designed scenarios, installing both packs takes up almost 500MB of disk space, but vastly expands gameplay.

Commanding an army in a millennia-long galactic war is hard work. Choose your battlefield (from ruined city to lush mountaintop to island archipelago), then build an army of as many land, sea, and air units as you can keep in good condition. The key is managing resources: metals and energy. Metals build mechanical soldiers and equipment, which

are energized by solar, wind, or tidal power generators. Resource allocation resembles SimCity's more than that of an if-it-moves-shoot-it game such as Doom.

Gameplay is intuitive and deceptively easy at first, but once you blow away the opposing commander, you suddenly find yourself fighting for your life against a relentless enemy stocked with firepower. With soldiers and planes criss-crossing every which way, the onscreen battle can spiral out of control—a recipe for a quick and messy defeat. Limit the action to a manageable level and don't let it become a free-for-all.

Sharp, clear graphics mark each army, and the full-motion animation includes lumbering robots and fighter planes crashing to the ground. The 3D battlefield lets you fire over a mountain or send your bombers over the enemy camp. On a 300MHz G3, the game moves at a smooth pace without hogging resources. The animation is fluid and easy to follow, even though the game doesn't use hardware acceleration.

A dark, brooding soundtrack is audible throughout gameplay; you can turn the music

down or off if you wish. You can even insert your own music CD and destroy the enemy to the tunes of ZZ Top or even Barry Manilow (although that might be a bit disturbing).

If you tire of battling the computer, Total Annihilation supports multiple players over an AppleTalk or TCP/IP network, provided that each player has his or her own individual version of the game—MacSoft requires users to keep the CD inserted during gameplay. The human element adds a new dimension to the game. While the computer responds faster to attacks and potential threats, people are more inventive and just plain merciless. Up to ten people can take the field at once, but the more players you have, the higher the system requirements. The game supports Internet dial-up connections at 28.8 Kbps or faster, but anything short of a DSL or T1 connection will be frustratingly slow and unstable.

We found ourselves compulsively glued to the screen, planning our next move against the hated adversary far into the night. This game is not just another Duke Nukem-style shoot-'em-up. With its emphasis on strategic thought, multiple-player support, and compelling ability to suck you right into the action, Total Annihilation reaches a new level of game playing.—Mark D. Shuchat-Marx

Solar Collector: Under Attack

**GOOD NEWS:** Not your usual blood-'n'-guts war game. Requires strategic thought. Very good graphics. Multiple players supported. Addictive.  
**BAD NEWS:** Addictive. Constant activity can be confusing at times.







## Perfection 1200U

### HARDWARE

**COMPANY:** Epson

**CONTACT:** 800-463-7766, <http://www.epson.com>

**PRICE:** \$249 (\$SRP)

**REQUIREMENTS:** USB iMac, G3, or G4; Mac OS 8.1 or later; 32MB of RAM; 50MB of hard disk space; CD-ROM drive



**THE PERFECTION 1200U'S ADJUSTABLE SCANNER COVER handles three-dimensional objects from telephone books to small, furry animals.**

PHOTO COURTESY OF EPSON

Looking to put photographs on your Web page, email newspaper articles to a friend, or fax documents without a fax machine? If you answered yes, chances are you're in the market for a scanner. And if you're an iMac, G3, or G4 owner, you might want to consider this one.

The Epson Perfection 1200U offers speedy, high-resolution scanning at 1200-dpi optical resolution (9600 by 9600 dpi interpolated) in a USB scanner that even the most technologically challenged person can understand. It supports OCR (optical character recognition) and comes with a great CD-ROM bundle that offers Adobe's Photo Deluxe, Broderbund's The PrintShop PressWriter, and three other applications, plus your choice of two additional software titles sent by mail (including Diablo and Corel Photo-Paint 8—sweet!).

Using a scanner couldn't be any easier. With USB, just plug and play. Epson TWAIN serves as the scanning interface and features two menus—the Easy menu provides basic settings, while the Advanced menu offers a variety of adjustments, including resolution, targeting, and more. PageManager, the scan management program, features a nice drag-

and-drop application dock that allows you to open scans in your application of choice. Press the one-touch scan button to open PageManager and Epson TWAIN and get a quick scan of whatever is lying on the scanner bed.

We scanned a variety of items at different resolutions. (We hope Epson doesn't inquire about the cat fur on our review model.) When scanning photos at 300 to 600 dpi, the Epson Perfection turned out exceptional results, with true color reproduction and clarity—all the way down to the dust and fingerprints. (Remember to clean the scanning surface and your photos before scanning at high resolutions.) Scanning images at 1200 dpi resulted in some linear artifacts on a few scans, however. Magazine pages with text and graphics also produced impressive results. We rescanned a magazine page using OCR to see if the type would translate into a Word document. It did.

Unfortunately, things weren't as rosy when we scanned several newspaper columns from the *San Francisco Examiner* using OCR. We scanned the columns at the recommended 400 dpi but couldn't get Word

to recognize any of them. We then tried scanning columns from the *San Francisco Chronicle*, which (surprise!) worked fine (though there were quite a few typos in the resulting document). Could it be the quality of the newsprint or paper stock? Maybe we'll blame the *Examiner*.

We had better OCR results when scanning text documents. However, the scanner didn't recognize some fonts and font sizes accurately. Documents with a font size of at least 12 points translated pretty decently, but you should proofread scans to catch mistakes. Still, the Perfection worked fairly well overall, and the time it took to correct the occasional error was minute.

Delirium set in and we started scanning oddball items like cordless phones and phone books (the adjustable scanner cover made this possible), candy, guitar picks, a hand, and one cat butt (she insisted on sitting on the scanner) to see how it would handle three-dimensional objects. Set in Color Photo mode, these scans all turned out beautifully.

All in all, the Perfection 1200U produces great scans without the wait, and its high resolution lets you scan in small images to output good-looking, larger-than-life files. We're a little lukewarm on its OCR performance but appreciate its other benefits. It's a great scanner for most graphics needs, and with a little imagination, the creative possibilities are endless.—Kris Fong

**WE SCANNED THIS PHOTO AT 600 DPI. In a side-by-side comparison, the scan's color and image clarity rivaled that of the original.**



**CAPTURE AN IMAGE WITHOUT A CAMERA! We originally scanned these guitar picks at 1200 dpi, but sized them down for printing here.**



**GOOD NEWS:** One-touch scanning. Self-adjusting scanner cover. Great CD bundle. **BAD NEWS:** Some linear artifacts in higher-resolution scans. OCR can be temperamental.







# Sorenson Video 2.1 Developer Edition

## MULTIMEDIA

**COMPANY:** Sorenson Vision

**CONTACT:** 888-767-3676 or 435-792-1200,

<http://www.s-vision.com>

**PRICE:** \$499 (SRP)

**REQUIREMENTS:** PowerPC, Mac OS 7.6 or later, 15MB of free hard disk space, QuickTime 3.0 or higher

As media professionals know, compressing large video for distribution via CD-ROM, Intranet, or Internet is a trade-off between video quality and file size. A movie that's too large will be hard to distribute, but compression that leaves video blurry will disappoint the audience. Sorenson Video Developer Edition, a QuickTime codec, strikes an uncanny balance between video quality and storage quantity. The result is an industry-leading video codec that every pro should use.

Chances are, if you own QuickTime 3 or 4, you already have the simplified version of Sorenson Video built in. That version has limited keyframe settings and fixed data-rate controls, and it doesn't let users watermark, quick-compress, or scale playback for different computers. Sorenson Video 2.1 Developer Edition includes all these features, plus it works as a plug-in for QuickTime-savvy media programs like Final Cut Pro and Media Cleaner Pro. You can export using quick, pre-fab export settings like "2X CD-ROM," or tweak everything from frequency of keyframes to data rate and minimum quality.

Controlling the data rate (the amount of space that the video takes per second) is important for video stored on a CD-ROM, remote drive, or Web server. You may want to limit your data rate to 180 Kbps for a CD-ROM in order to store an hour of video, or you may limit a streaming video to 1.5 Kbps so that most modem users can watch it as it downloads. If you have Media Cleaner Pro, which orchestrates the settings for QuickTime audio and video compression for any codec, you can set a dynamic rate with average and peak values. The program allocates more space to the parts of your movie where images change frequently than to the static sections, but all of it stays below your peak setting. For videophiles, this feature alone, which is built into Sorenson and unlocked in Media Cleaner, justifies the upgrade because of the improved file clarity.



**THAT'S NOT WATER ON THE LENS.** Our Cinepak test video (left) wasn't selective enough in choosing which information to toss, yielding a blurred image. Sorenson (right) did a better job of determining what to keep and what to dismiss.

We pitted Sorenson Developer Edition against Cinepak, another frequently used codec. Compressing a short animation resulted in a tie, but a 3-minute, live-action video that weighed in at 500MB really showed off Sorenson's advantage. We compressed this full-screen video to 320 by 240 pixels at 15 fps. A mono 22.05KHz audio track was included but not compressed.

Visual results of the compression were reasonably close, but overall Sorenson looked better. Cinepak handled the quick

The Cinepak file compressed to 26.2MB, while the Sorenson version was 14.5MB.

Other key features include support for RTSP and HTTP Internet streaming. Sorenson can't broadcast alone—you must couple it with another program that streams and supports QuickTime codecs. It also includes a watermark feature to protect your productions from theft.

Our biggest gripe with Sorenson Video is that it doesn't include Media Cleaner Pro. We recommend purchasing a Sorenson bundle that includes Media Cleaner. With this combination, you can use variable bit rate encoding, and you'll have better streaming control than you would in QuickTime Player. Also, Sorenson doesn't compress audio—Media Cleaner handles audio compression well.

Sorenson Video is one of the best codecs for reducing a video's file size while retaining excellent image quality. The high cost of a camera and editing software justifies adding the price of Sorenson—you want to get the best possible results from your expensive equipment, after all. Hobbyists may get by with the basic, free codec, but professionals will truly benefit from the enhanced data rate control of the Developer Edition. For pros, adding Sorenson to their production arsenal is a necessity. —Zack Stern



**KEEP TABS** on your settings with this summary window.

transitions slightly better than Sorenson, which several times displayed blurred artifacts after a contrasting cut. But Cinepak often displayed pixelated edges and had difficulty retaining the outlines of a busy background, while Sorenson showed subjects with clear edges and few artifacts overall. However, the size difference was significant.

**GOOD NEWS:** G4 Velocity Engine support. Retains quality in small files. Watermark integration. Gives control over important settings.

**BAD NEWS:** Expensive for dabblers. Media Cleaner sold separately.







## ProTV

### HARDWARE

**COMPANY:** Formac

**CONTACT:** 925-251-0100, <http://www.formac.com>

**PRICE:** \$99 (SRP), \$109.95 (street price)

**REQUIREMENTS:** PowerPC, System 7.6 or later, available PCI slot



PHOTOGRAPHY BY AARON LAUER

**W**hat more could you ask for than watching TV on your computer while working on your finances or surfing the Web? What a great combination—and Formac's ProTV PCI card makes it all possible. Just launch the ProTV application from the handy control strip module to watch TV in a window on your computer screen. This \$99 piece of computer hardware gives you a tremendous bang for your buck. Watch TV with its 125-channel cable-ready tuner, or use ProTV to capture full-screen NTSC (National Television System Committee) video via the S-Video or RCA connector.

The detailed manual makes installing the PCI card into your computer a breeze, but the connections for audio can be difficult. There are two options for accessing TV audio, one internal and the other external. The internal connection requires that you connect two cables (included with ProTV) to the card, which you then insert into the audio chain between the CD drive and the logic board. This solution provides you with a simple, maintenance-free connection—unless you use Mac OS 9. OS 9 does not channel CD audio through the CD drive's analog audio cable, so ProTV no longer plays the audio when connected internally.



**THE CONTROL STRIP MODULE** lets you program your favorite channels, but the initial configuration is more complicated than it should be.

We hope that Formac will remedy this glitch with a software patch.

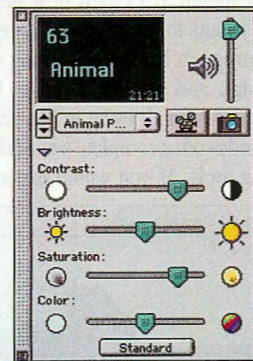
Luckily, there is an alternative external connection method for audio. ProTV includes a short patch cable that goes out of the ProTV PCI card and into your computer's audio-in jack. This method works with Mac OS 9, but means that your audio-in jack is now unavailable for other peripherals, such as a microphone. Owners of Bondi-blue iMacs (revs A and B) have a mezzanine slot and should buy ProRaidTV for \$159. Unfortunately, there's no ProTV package available yet for the fruit-flavored iMacs (revs C through E).

The included software is a mixed bag. Version 2.0.5 of the ProTV software consists of an extension, a control strip module, and an application. The extension enables any standard video application to access the video-in jacks on the ProTV card. Formac also includes a version of Adobe Premiere LE, which enables you to create your own QuickTime movies. ProTV's control strip module lets you easily access the ProTV application as well as your configured channels, but you need to program in your favorite channels—and configuration is anything but intuitive. By default, the software is configured for European viewing. You must switch it from PAL (programmable array logic) to NTSC and set it to access U.S. television. But the manual does get you up and going fairly quickly. The difficulty comes when you're adding and naming the channels you want available via the control strip module. If you do this incorrectly, you could end up with 125 unnamed items that you can't reconfigure. Trashing the ProTV preferences fixed most anomalies, but one would expect a

**I WANT MY PROTV!** Watch and capture full-screen NTSC video with this PCI card.

better experience when initially configuring new hardware.

Aside from minor software configuration difficulties, ProTV does exactly what it is designed to do: It shows TV on your computer screen. You can also digitize video from a camcorder or VCR. This is not professional-quality video input, but it's more than adequate for creating Web videos or QuickTime movies, or for grabbing a still from a video-



**SITTING AT A COMPUTER** has never been so unproductive—ProTV lets you watch while you work!

tape. Unlike high-end cards, ProTV does not have any video-out capability for printing video to tape.

Formac has done a wonderful job of bringing TV to PCI Macintoshes for an affordable price. Gotta go, *A-Team* reruns start in 10 minutes!—*Buz Zoller*

**GOOD NEWS:** Amazing value. Easy installation. Inexpensive video-in solution. Includes Adobe Premiere LE.

**BAD NEWS:** Software is unintuitive and can be difficult to configure. Problems with Mac OS 9's audio implementation. European defaults and features can be confusing. No version available for owners of iMacs revs C through E.







## DenebaCAD 2.0

### DESIGN & GRAPHICS

**COMPANY:** Deneba Systems

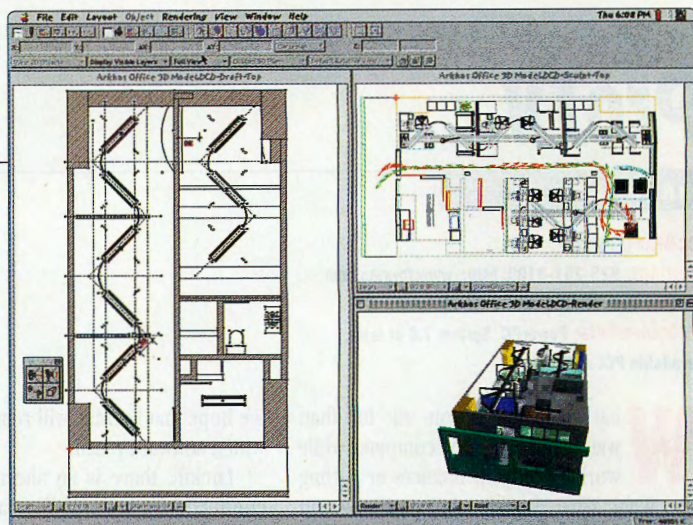
**CONTACT:** 305-596-5644, <http://www.deneba.com>

**PRICE:** \$575 (SRP), \$499.95 (competitive upgrade), \$299.95 (regular upgrade)

**REQUIREMENTS:** PowerPC processor, 32MB of RAM, 20MB of hard disk space, CD-ROM drive, 24-bit color video display capable of 800 by 600 pixels or higher

As venerable as the CAD field is, there is still plenty of opportunity for breaking into the market. Deneba Systems is trying to do just that with the latest release of DenebaCAD 2.0. This program is a relative newcomer to the field—and a very promising one. It's not a dressed-up drawing program, but a real 2D/3D architectural CAD program with sophisticated 3D rendering capabilities.

You can use DenebaCAD for any sort of CAD work, but it's designed with architecture in mind. It applies to a variety of scales, from individual rooms to a campus of large buildings. The program has three working modes: Draft, Sculpt, and Render. Draft is for 2D design, Sculpt is for drawing in 3D, and both of these modes offer complete sets of drawing and editing tools. As you would expect from



**AUTOMATICALLY CREATE AND ARRANGE multiple views with DenebaCAD.**

any CAD program, you can draw either with a pointing device (such as a mouse or drawing pad) or by entering coordinates for precision work. You can also duplicate objects as linear or polar arrays, and project or extrude 2D patterns into 3D objects along arbitrary paths (sweep) or by rotating around an axis (spin). You can position objects on and align them with default or user-defined grids, using a fairly powerful snap menu. The program includes libraries of standard objects for architecture. Perhaps to its credit, Deneba has not even attempted to support mechanical or electrical engineering.

Render mode lets you see how the finished project will look, complete with surface patterns, effects, and natural and artificial light. These absolutely stunning 3D views and presentations are the real beauty of the program. You can make still images, QuickTime movie walk-throughs, QuickTime VR environments, and stereoscopic views. (The program comes with 3D glasses.) To top it all off (and with no additional work), you can view a project in Draft, Sculpt, and Render modes simultaneously. Once you have the drawing done in one mode (Draft or Sculpt), all you have to do is choose Show Render or Show Sculpt from a pull-down menu, and DenebaCAD opens a new view in the mode you want. DenebaCAD can also arrange the windows so that they don't overlap.

We sketched several simple test buildings in a matter of minutes and then leisurely explored lighting and appearance—for many clients the most important aspects of a project. You have a wide selection of visual effects and patterns to choose from. You can adjust transparency, reflectivity, brightness, and

gloss on any surface, and the program handles both natural and artificial lighting well.

DenebaCAD supports a wide variety of file types for both import and export, including the AutoCAD standard DWG up to release 14.01, as well as lots of other useful items, such as Adobe Illustrator—good news for anyone moving up from a drawing program. The program also supports American (ANSI), British (BS-380), German (DIN), International (ISO), and Japanese (JIS) dimension standards.

The interface is wonderfully easy to learn and vastly more intuitive than the industry standard, AutoCAD. (That's not hard to do, especially since AutoDesk went strictly pee-ee.) However, it's not quite up to the Macintosh standard for day-to-day work. There's not even an option for rulers, the pan tool is badly implemented, and you get just one level of undo.

DenebaCAD's main competitor is VectorWorks from Diehl Graphsoft. VectorWorks—designed for many different CAD markets, not just architecture—is also more expensive once you throw in the \$299 RenderWorks module to make it comparable to DenebaCAD. So while it won't replace VectorWorks for mechanical or electrical engineering, DenebaCAD is an excellent—and cost-effective—choice for architectural design and presentation.—*Eric Black*

**GOOD NEWS:** Beautiful presentations and gorgeous walk-throughs. Wide selection of textures and visual effects. Short learning curve. Excellent documentation. Relatively cheap.

**BAD NEWS:** Unfinished interface. Designed only for architecture.



**DENEBCAD HANDLES NATURAL LIGHTING well.** You can specify the position of the sun either by the angle it makes with the building or by date, time, and location—for example, 3 p.m. on May 5 in Aspen, Colorado.





# reviews

## FontAgent 8

### UTILITY

**COMPANY:** Insider Software

**CONTACT:** 800-700-6340 or 760-804-9900, <http://www.insidersoftware.com>

**PRICE:** \$69.95 Standard Edition download (unlimited fonts on one Mac), \$29.95 Limited Edition download (250 fonts on one Mac); check the Web site for other pricing options

**REQUIREMENTS:** Any Macintosh running System 7 or later, 3MB of RAM, 2MB of free hard disk space



FIND A  
DEMO of  
FontAgent 8  
on The Disc.

**B**ack in the old days (1998), there was a little font utility called Font Box. It was user-friendly, efficient, and wise to the wily ways of fonts. It also endured a lot of criticism for being *just* a font repair and maintenance utility. Users who wanted to manage their well-maintained fonts had to look elsewhere.

In 1999, Insider Software rewrote the program and renamed it FontAgent 8. And while FontAgent is still just a font repair and maintenance tool, it's a darn good one.

More user-friendly than ever, FontAgent 8 offers a range of options for complete control of your font library. You decide which font volumes the program examines, moves, deletes, or packs into suitcases, and how it stores the remaining fonts. Did somebody say network? Administrators can work from one machine and create master

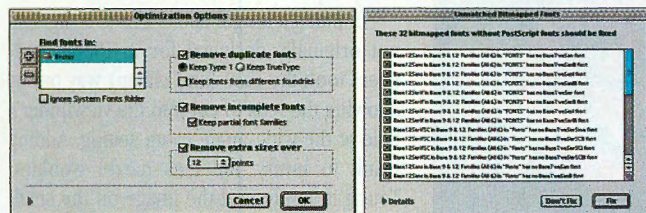
font libraries for entire workgroups.

Utility software is rarely sexy, but FontAgent is the next best thing: efficient. FontAgent scanned our 9GB test volume and did its magic on the 100-plus

fonts in a matter of minutes. The Mac hadn't been misbehaving, but FontAgent fixed 436 minor errors that were just waiting to escalate into Mac-paralyzing monster errors.

### tip

Mac OS 8.6 users should get Apple's Font Manager updater to avoid a bug with Type 3 fonts (<http://asu.info.apple.com/swupdates.nsf/artnum/n11489>).



**OPTIMIZATION AND ORGANIZATION OPTIONS (left), plus detailed problem reports and fix confirmation dialog boxes (right), give you absolute power.**

FontAgent does have an Achilles' heel in its treatment of 2-byte fonts (including many Asian-language fonts). To avoid damaging these, put them in a folder named Problem Fonts, and FontAgent will ignore them.

Given the easily corruptible nature of fonts and Insider's reduced-price options for home users, FontAgent 8 is well worth the price for almost anyone. If your business traffics in fonts, it's essential.—*Niko Coucouwanis*

**GOOD NEWS:** Scaled pricing scheme. Tames the most beastly font collections. Wide variety of preferences. Saves custom settings.

**BAD NEWS:** Pretty much a yawner for anyone who's not a fonthead. An ounce of prevention may be useful, but it's not very exciting.



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# reviews

reviews

## Ricoh RDC-5300

### HARDWARE

**COMPANY:** Ricoh

**CONTACT:** 888-742-6410 or 973-882-2000, <http://www.ricoh-usa.com>

**PRICE:** \$699 (SRP)

**REQUIREMENTS:** PowerPC with serial port, System 7.6 or later; or iMac or G3 with USB port, System 8.5 or later; 32MB of RAM, 80MB of free hard disk space, CD-ROM drive



PHOTOGRAPH BY AARON LAUER

**T**he 2.3-megapixel Ricoh RDC-5300 is slightly brawnier than its lackluster predecessor, the Ricoh RDC-5000. It adds a few more features—an extended range zoom, a larger grip, a soft-image mode, autobracketing of exposures, an external flash connector, and the capacity for 32MB SmartMedia memory cards. But the RDC-5300 isn't worth its hefty price—it suffers from serious flaws.

### Key Specifications

**Size and weight:** 5.2 by 2.7 by 2.1 inches, 16.5 ounces with batteries  
**Sensor:** 2.3 million pixels  
**Resolution:** 1792 by 1200, 896 by 600, 640 by 480  
**ISO:** 100  
**Lens:** 38mm to 114mm optical zoom (equivalent), 2.5X digital zoom  
**Aperture:** wide f-3.2 to f-15, tele f-3.7 to f-17.2  
**Shutter speeds:** 1 to 1/500 second  
**Exposure control:** auto (manual override +/- 2 stops)  
**Light meter:** center weighted  
**Focus:** auto, macro (to 1.6 inches)  
**Flash:** four modes (auto, on, red-eye, slow sync)  
**White balance:** auto or manual  
**LCD monitor:** 1.6 inches (effective)  
**Optical viewfinder:** yes  
**Memory:** SmartMedia (not included)  
**Interfaces:** serial, USB, video out (NTSC and/or PAL)  
**Extras:** slide-show, time-lapse, sepia, and black-and-white modes  
**Documentation:** printed  
**Mac software:** ArcSoft's PhotoBase, PhotoStudio, PhotoPrinter, PhotoFantasy, PhotoIsland; Ricoh Camera Utility for serial transfer  
**Comes with:** four AA alkaline batteries, instructional video, user's guide, cables, 8MB of internal memory, AC adapter, wrist strap, and case  
**Options:** SmartMedia cards, remote control, PC Card adapter, floppy disk (Flashpath) adapter  
**Warranty:** one year

The RDC-5300 is a slug: You'll wait 6 seconds from On to Ready mode, 9 seconds between shots, and 4 seconds when you switch from Record to Play. When you set it to Sequence, you encounter hurry-up-and-wait mode. You *can* shoot pictures at 1-second intervals, but they don't get processed as you take them. After you've shot three pictures, you'll stare at a blinking "Recording" message on the screen for an eternity of 14 seconds. And though the RDC-5300 can accept larger-capacity SmartMedia memory cards, the camera ships without *any* card; you'll have to make do with its mere 8MB of internal storage—pretty puny for a 2.3-megapixel camera—until you shell out the extra cash for a removable card.

Reminiscent of the old RDC-5000's trouble handling reds and pinks, similar color-fidelity problems plague the RDC-5300—if



**LACKING FLOWER POWER,** the RDC-5300 has difficulty recording reds and pinks and gave the flower at top an orange hue (bottom image).

**THE RICOH RDC-5300 offers extended zoom and higher memory capacity, but has serious speed and color problems.**

orange is your favorite color, this may be just the camera for you. Many digicams do have overall color casts, but a mouse click in an imaging program quickly eliminates them. The RDC-5300's big weakness is that the cast is *color specific*—a photographer's worst nightmare, and impossible to correct without screwing up every other color in the image.

The RDC-5300's new autobracketing feature is just plain dumb, since digicams let you see results instantly and make on-the-spot corrections. Autobracketing attempts to satisfy professional-level photographers by providing one image at normal-level exposure, another image at +0.5 EV, and a third at -0.5 EV. You'll get three differently exposed images, all right, but odds are slim that you'll like the correctly exposed picture the best.

In fitting a longer zoom lens to a digicam not originally designed for it, Ricoh engineers took the easy (and cheap) way out by allowing the lens to cut into the viewfinder's field at the wide-angle zoom setting. Adding insult to injury, the lens barrel wobbles. Touch it lightly, and the image on the small LCD monitor (which is horribly grainy in low light) will do a little jig—up, down, right, or left. There's a big potential here for out-of-focus images and a hefty repair bill once the camera's out of warranty.

Ricoh should stick to making copying machines if this outrageously high-priced dud is the best it can offer in the highly competitive digicam market.—Arthur Bleich

**GOOD NEWS:** Instructional video. Good software package. Printed documentation. USB.

**BAD NEWS:** Extremely slow. Poor color accuracy. LCD monitor very grainy in low light.







## Black & Whites 1.3

### MULTIMEDIA

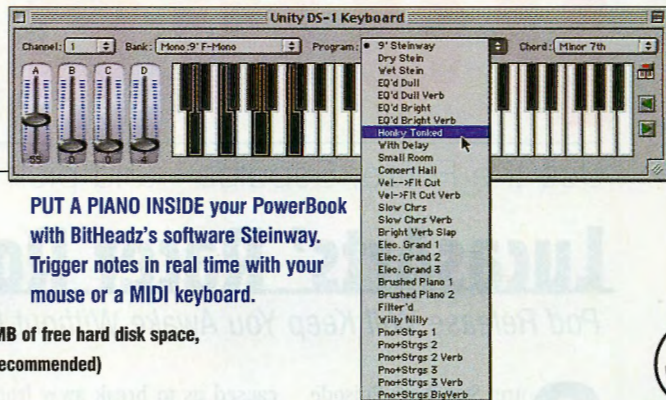
**COMPANY:** BitHeadz

**CONTACT:** 831-465-9898, <http://www.bitheadz.com>

**PRICE:** \$199 (SRP)

**REQUIREMENTS:** PowerPC 200MHz or faster, System 7.6.1 or later, 64MB of RAM, 250MB of free hard disk space,

CD-ROM drive, 600 by 800 or higher-resolution monitor (MIDI interface and keyboard recommended)



PUT A PIANO INSIDE your PowerBook with BitHeadz's software Steinway. Trigger notes in real time with your mouse or a MIDI keyboard.

**E**lectronic keyboards can be cruel. They look like pianos, but their sound is often pinched and artificial. To keep the price low, manufacturers skimp on the ROM used to store the component sounds (samples), shortening them to mere blips.

Black & Whites, on the other hand, is a software-based synthesizer that employs generous samples of actual Steinway pianos (as well as funky electric pianos). The samples are stored in your Mac's RAM, so they can be quite large and lifelike—several are over 40MB. For more realism, some of the presets switch samples as you play louder.

Indeed, we found those that *didn't* switch unsatisfying; a real piano changes timbre when you pound it.

The program is a playback-only version of Unity DS-1, BitHeadz's powerful software sampler, which we rated *Freakin' Awesome* in May 1999. Both programs offer extensive sound-shaping capabilities, though you'll need MIDI expertise to access them. For those who just want to dial up a sound and play, Black & Whites provides 29 variations for each of its 37 presets. These variations apply envelopes, filters, and effects to the sound. You can also run the program's output

through the effects in compatible sequencers.

For optimum expressiveness, you'll need to fiddle extensively with the control panel. With the initial settings, we couldn't make the individual notes sing out. But after some tweaking, the sonic improvement compared to every other keyboard in our studio was black and white.—David Battino

**GOOD NEWS:** Warm piano sound. Integrates well with software sequencers. Can save output as audio file. **BAD NEWS:** Tweaky setup. Craves RAM. Inadequate documentation.



**BLACK & WHITES**  
Samples on The Disc.

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AOL 4.0	1	Photoshop 5.0	10
AppleWorks 5.0	6	Photoshop 5.5	
Color Management	1	New Features	2
Excel 98	6	PowerPoint 98	3
FileMaker Pro 5.0	6	Premiere 5.1	5
Graphics To PrePress	1	QuarkXPress 4.0	4
iBook	1	QuickTime/VR	2
Illustrator 8.0	6	Retouching	1
iMac	1	Scanning & Halftones	1
iMac DV	1	Troubleshooting Mac OS	4
InDesign	5	VectorWorks	5
Internet Explorer 4.5	1	Website Development	
Layouts & Output	1	Made Easy	3
Mac OS 9	4	Word 98	6
Netscape Navigator 4.6	1		

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# power play

Use the Force, Sebulba—and pick up some soda on the way home.

## LucasArts' Racer Roars Out of the Gates

*Pod Release Will Keep You Awake Without Making You Fear Aliens under the Bed*

**S**ure, Star Wars Episode I Racer may have sounded a bit lame, but when LucasArts announced the game, we were all jonesing for the other *Star Wars* games that weren't coming to the Mac—Racer was at the bottom of our wish list. Boy, were we wrong. The newly released Racer proves that LucasArts is back on the Mac in the right way, offering a first-class game. Here's a preview of the game—in stores right now—that has

caused us to break away from playing Quake III Arena.

In Racer, you play a speed junkie willing to sit in a small, one-person pod leashed to two gigantic jet engines by what look like steel cables. Presumably, the same levitation system that hoists land speeders off the ground keeps the whole assemblage in the air.

Haul this rig out on a track, punch the throttle, and you're racing. Win enough races, and you can buy upgrades for your pod, including faster acceleration, better cornering, and better traction (although no one has yet managed to explain why a hovering vehicle would deal with traction in the first place).

Using a few key combinations (or a mouse or joystick and even fewer keys), you pilot your freakishly proportioned vehicle on any of over 20 race courses (each with differing characteristics, such as anti-gravity tunnels and Tusken Raider sniping) in an attempt to win fame and fortune by finishing in one of the top four



**NO, THOSE RIBBONS OF GAS** aren't going to help you win your race. Instead, you'll have to rely on sheer intestinal fortitude to win.

positions. The game itself is easy to play, which adds to its appeal, and it features a network mode in which you pit yourself against other poddites.

A few words of advice: Upgrade often, get the best top speed you can, decelerate around the corners, and turn the sound way down when you are buying parts from Watto—he can be pretty annoying to listen to.—*DR*



**WITH A TAP** of the tilde key, you can switch to any view, including this entertaining view from between the engines. Makes it hard to fly, though.



**AFTER A RACE**, check out your racer and watch while the pit droids repair the damage you caused.



**SCRAPE THAT ENGINE** too much and it'll come right off. You'll spin...



and spin...



...and spin, until you crash into the racecourse.



# Is Deluxe Star Trek Starship Creator the Worst Game Ever?

*Simon & Schuster Stakes Its Claim to the Bottom of the Heap*

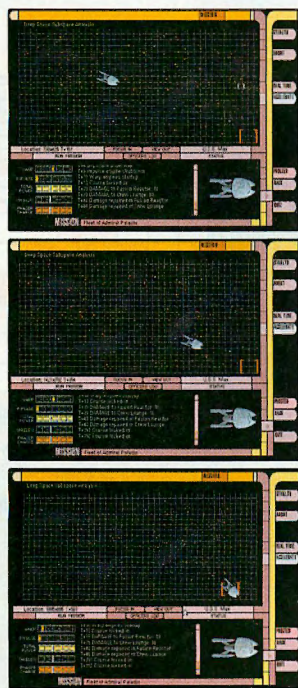
**T**he concept of a starship creator based on the *Star Trek* series is a compelling one. Unfortunately, Simon & Schuster has managed to turn the idea into a game so utterly and spectacularly flawed that it must be counted among the worst games ever created in the history of computer entertainment. *Star Trek Starship Creator* will quickly make you yearn for the hectic, fast-paced action of *SimEarth*.

*Starship Creator* is divided into two components. When the game starts, you specify a ship type, add systems to it, and hire a bridge crew. You then send the ship you've designed and staffed on missions; its success depends on your design. So far, so good—but the game quickly falls apart. To start with, the starship creation engine is deeply flawed. Ship design involves very few realistic trade-offs—basically, the more junk you shove into your ship, the better off you are. The only real limitation is power—but it's hard to figure out what that limit is, since the game never tells you just how much power you have left. Hiring a crew is similarly vague—the game lacks any consistency with the series, and characters have no "specialties" other than the amount of money they demand. Characters who are dead, in jail, or stranded in the Delta quadrant in the series itself are all available for use in this game.

As bad as the creation engine is, it's the mission component that makes this game truly catastrophic. Once you send the crew on a mission, you have *no* control over the ship or its crew, beyond occasional dialog boxes

reminiscent of the worst that HyperCard stacks ever offered. Worse, even in Accelerated mode your ship typically spends over 7 minutes of real time just getting to the planet or location where the mission takes place. Except as a cure for insomnia, the missions are unbelievably awful—it's hard to even describe them as gameplay, as you aren't actually doing anything. At best, it's a strange sort of interactive fiction without the interactivity and with extremely poor fiction.

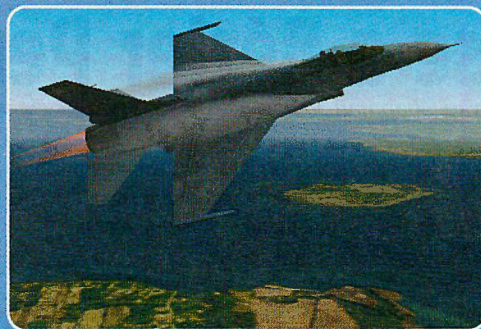
Sadly, we've only scratched the surface of the problems—a host of lesser flaws plagues the game, from graphics glitches to scroll bars that work in reverse. As an exposé of just how dull life in *Starfleet* really is, it's not bad, but as a game it's a dead loss.—*JS*



**UNBELIEVABLY, THE THREE SHOTS HERE** represent almost 5 minutes of staring at the screen, doing nothing. Note that we have even selected Accelerated mode.

## Screen Shot of the Month

This month, we feature not one but *two* beautiful screen shots by some of the best game artists ever to play on a Mac. If you want *your* shot at 15 minutes of fame (or at least bragging rights), send your best gaming pictures to [letters@macaddict.com](mailto:letters@macaddict.com). Be sure to include your full name so we can show you respect.



### Artist's Statement

This shows what a blue-and-white G3 350 and a Voodoo2 can do—kick some butt.—*Jon Severinghaus*



### Artist's Statement

Attached is a shot of me (in a game the Mac Gamer's Guild Myth order hosted), using my tank Rommel to unload a 40mm shell on a squadron of unlucky soldiers. *Baboom!* Santa's Head did the radial explosion effect—I didn't add that.—*Stefan "My modem is on fire" Sinclair*

## What the Staff Is Playing...

### > Ian's Choice...

Madden NFL 2000—"It shouldn't be as addictive as it is."  
Star Wars Racer—"Same with this one."

### > Rob's Choice...

SoundJam MP—"Favorite part: turning up the bass."  
Rainbow Six—"Are you sure this isn't Quake?"

### > Narasu's Choice...

Star Wars Racer—"I am indestructible—I like it that you can wreck lots of times."  
Tomb Raider III—"I can't seem to get Lara out of her bedroom."





how to

bézier pen tool

# how to

Curving Pens, Broken Notes, and Stylish Words.

## Use a Bézier Pen Tool

by Elyse Chapman



TRICKY

Say you've just bought a drawing application, or your page layout software has added some drawing doodads. In the documentation, you run across a term that's new to you:

Bézier tools. What the heck are they, and why can't you just drag 'em across a page to create a line as you can do with a pencil? You've heard these tools can create nice, smooth lines, but how? Why is it that you can enlarge these lines and keep 'em smooth while an apparently identical

line, drawn with a brush or pencil tool in a paint program, gets all jagged and stair-steppy? We're so glad you asked!

Vector lines and curves are basically a collection of mathematical specifications that describe the curves the program makes. Don't panic—there are no formulas or theorems to memorize! The drawing program does it all for you: Tell it what to do by clicking your mouse and placing anchor points, and the program draws the line or curve between these points. It's even easier than it sounds. Let's take a look.



TOUGH  
This stuff's for the pros.



TRICKY  
It'll take some effort, but you can do it.



EASY  
The fundamentals, if you will.



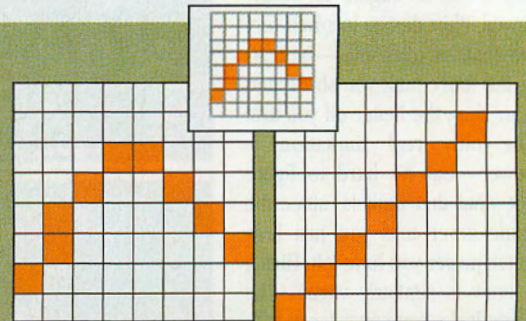
FIND  
PEN TOOL  
TEMPLATES  
on The Disc.

## Bézier, Raster, Vector...Huh?

A raster line, also referred to as bitmapped, is what you get when you draw with a pencil or brush tool in a paint or photo program. A vector (also referred to as Bézier) line is most commonly the product of a tool whose icon resembles a fountain pen nib.

When you draw a line in a paint program, you're working with pixels (square dots) on a grid. The grid divides up the entire drawing, and as you draw with the pencil tool, you change the color of each square that tool touches. You may not see individual pixels if the resolution of the document is higher than 72 dpi (the setting of most Mac monitors), but they're there. Zoom in on a section of your drawing and you'll catch a glimpse of them. Zooming in shows you the same phenomenon in your page layout software—big, stair-stepped squares of color instead of a smooth line or curve.

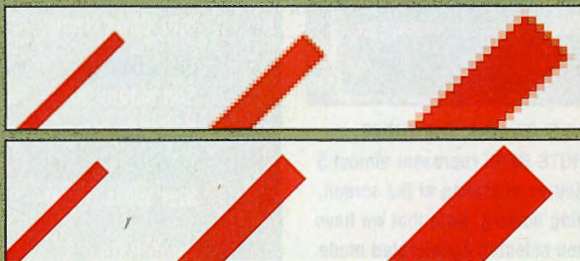
However, if you draw the same line with the pen tool in a vector drawing program, you can zoom in and enlarge the image as much as you want, and all you'll see is a crisp, smooth line. It won't have any jaggies, even when you print the image.



**RASTER LINES AND CURVES** have stair-stepped sides, but your eye doesn't usually see the steps when the image has a high resolution and the grid is small. Note that in the reduced view the curve looks a little smoother.



**MOST PROGRAMS** use an icon that looks like a fountain pen nib for the Bézier tool, but AppleWorks uses a different symbol.



**THESE TWO SERIES OF IMAGES** show what happens when you enlarge raster (top) and vector (bottom) versions of the same 8-point line. In both series the far left line is the actual size, the middle is enlarged 200 percent, and the right, 400 percent.

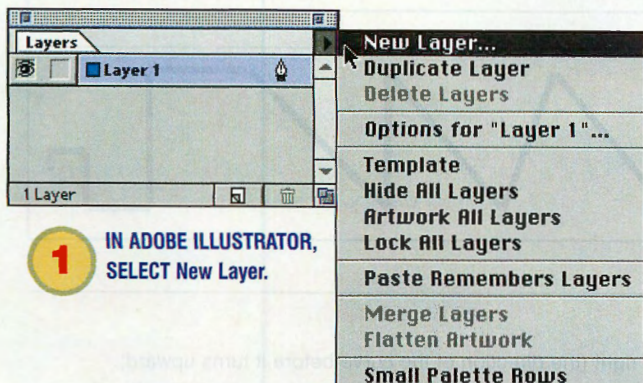
ILLUSTRATION BY DAVID "GOT MY MOJO WORKIN'" ROSS



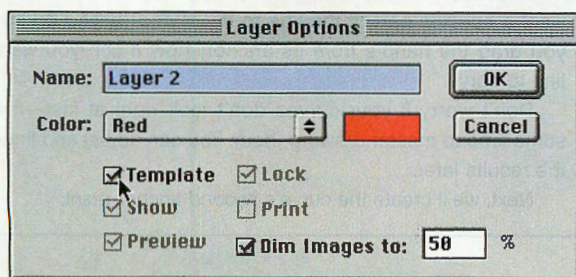
# Using the Templates

To follow along, see the template PICT images on The Disc. Many drawing programs either provide a template or background layer, or let you designate a layer as a template. That's where you'll place these PICT images. Assuming you're using Adobe Illustrator, create a new

drawing layer with the Layers palette and use Place (in the File menu) to insert the template image in your document. Once you've placed it, double-click the layer name in the palette, click Template, click OK, then click and drag the new layer beneath the drawing layer.



**1** IN ADOBE ILLUSTRATOR, SELECT New Layer.

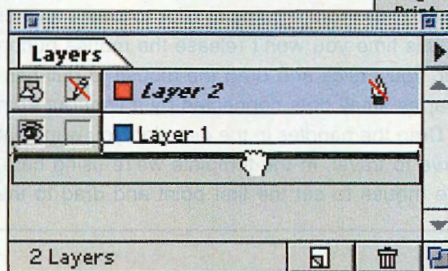


**3** DOUBLE-CHECK THE LAYER NAME to edit its options. Then select Template.

**2** PLACE THE PICT FILE you want as your template—select Place in the File drop-down menu.



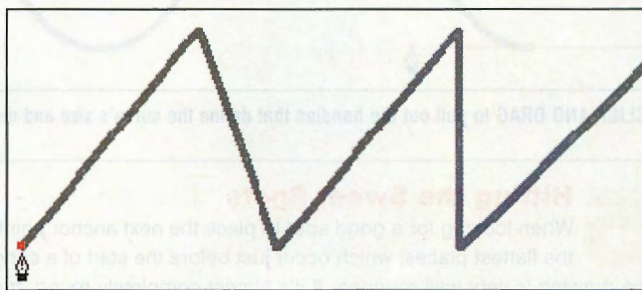
**4** DRAG THE TEMPLATE LAYER below the drawing layer.



## 1 The First Anchor

To illustrate what we mean by creating anchor points, which the drawing program uses to construct line segments, let's start by drawing straight-sided objects. If you are using the templates on The Disc, load Draw Straight Segments.pct.

With the pen tool selected, click and release the mouse button where you want the line to begin. You'll have nothing to show for your click but a dot, otherwise known as an anchor point, but that's the way it should be.



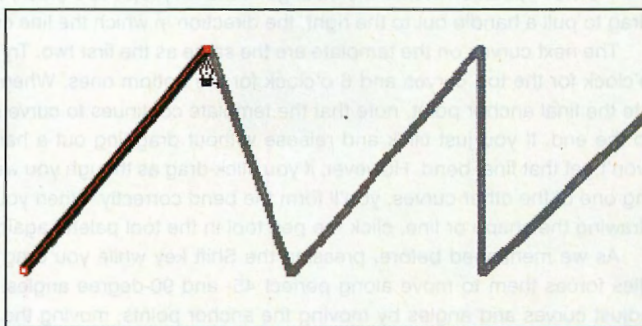
CLICK AND RELEASE to place the first anchor point.

## 2 On the Straight and Arrow

Next, click and release the mouse to place an anchor point where you want the line segment to end. The line you want should appear between the two points you created.

What's happened is that the specifications of the first and second anchor points determined the characteristics of the line drawn between them. In other words, your clicks told the program where you wanted the line to begin and where you wanted it to end. Because you just clicked and released to form the points, the line doesn't curve at all.

If you didn't get a line between the two points, you probably clicked the wrong tool or somehow deactivated the pen tool. If you ended up with two lone anchor points, either select and delete them both and start over, or delete just the second one, click with the pen tool on the first point to activate it again, and carry on from there.



WHEN YOU CLICK AND RELEASE again to form the second anchor point, a line appears between the two points.

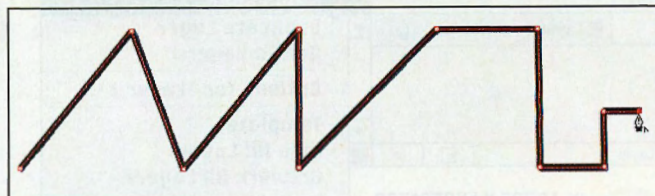
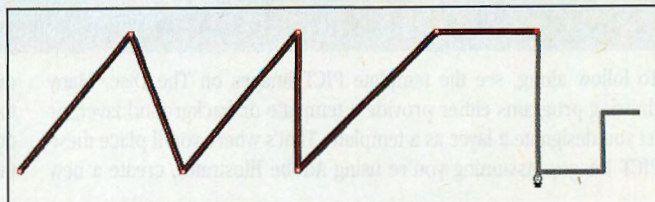


### 3 Perfect Angles

Now that you've drawn the first segment, click at the end of each segment to place anchor points and create the rest of the line.

Press Shift as you click the anchor points, and you'll see that it constrains drawing to perfect 45-degree and 90-degree angles. When you've completed your drawing, click the pen tool in the tool palette to tell the program you're ready to start drawing another object.

**HOLD DOWN YOUR SHIFT KEY to force perfect 45-degree and 90-degree angles as you draw.**



### 4 Making Waves

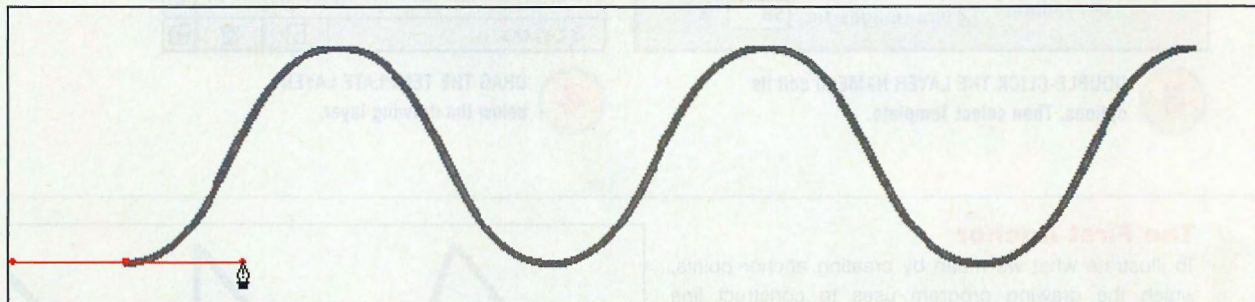
Now that you've got the hang of straight segments, it's time for curves. Use the Draw Practice Curves.pct file on The Disc as your template. You're going to click to create anchor points again, but this time you won't release the mouse button right away. Rather, you'll click and drag the mouse to pull handles (which appear as small dots connected by a line) out from the anchor point. Drag the handles in the direction you want that portion of the curve to travel. In the template we're using here, click and hold the mouse to set the first point and drag to the

right (the direction of the curve before it turns upward).

Anchor point handles tell the program in what direction you want a specific part of the line to travel and (based on how far you drag the handle from its anchor) how much you want the line to curve.

Don't worry if your curves don't look right at first—it takes some time to master drawing them. You can adjust and fine-tune the results later.

Next, we'll create the curve's second anchor point.



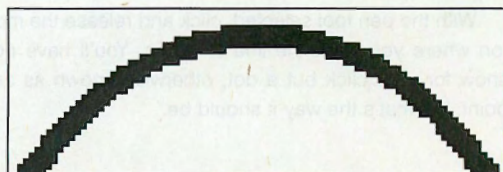
**CLICK AND DRAG to pull out the handles that define the curve's size and direction.**

### 5 Hitting the Sweet Spots

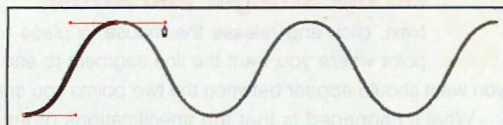
When looking for a good spot to place the next anchor point, look for the flattest places, which occur just before the start of a curve, unless the drawing is very well rounded. If it's almost completely round, try creating points at the 12, 3, 6, or 9 o'clock positions. Other good positions to place anchor points are at 2:30, 4:30, 7:30, and 10:30. Since there's no flat spot at the 9 o'clock position in this exercise, go to the very top (12 o'clock) and click-drag to pull a handle out to the right, the direction in which the line continues.

The next curves on the template are the same as the first two. Try using 12 o'clock for the top curves and 6 o'clock for the bottom ones. When you create the final anchor point, note that the template continues to curve smoothly to the end. If you just click and release without dragging out a handle, you won't get that final bend. However, if you click-drag as though you were drawing one of the other curves, you'll form the bend correctly. When you're done drawing the shape or line, click the pen tool in the tool palette again.

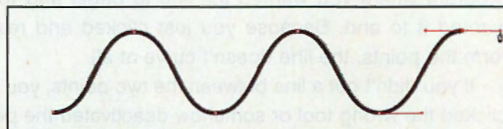
As we mentioned before, pressing the Shift key while you drag out handles forces them to move along perfect 45- and 90-degree angles. You can adjust curves and angles by moving the anchor points, moving the handles, or moving the curve segment itself by clicking it. (In Illustrator, switch to the hollow-arrow selection tool to adjust anchor points, handles, and segments.)



**LOOK FOR A FLAT SPOT on a curve.**



**CLICK AND DRAG OUT A HANDLE at the curve's 12 o'clock position.**



**PULL OUT HANDLES for the last point you draw, so you get the final little bend of the template.**



## 6 Putting It All Together

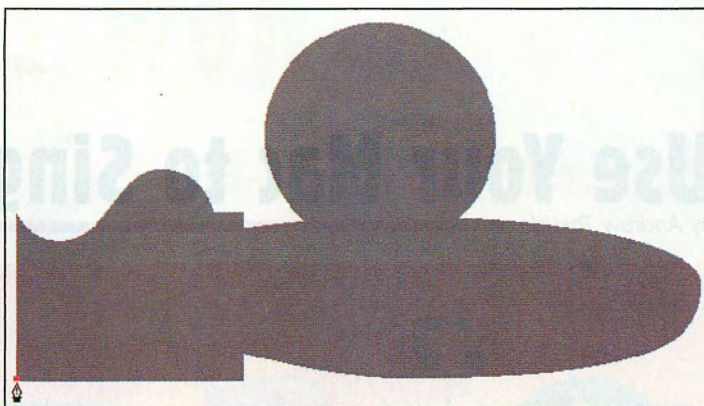
When you're ready to tackle a more challenging task, try building this much more complicated path. Use the Draw Practice Combo.pct file on The Disc as your template.

In that file, you'll find the shape at right, which has a challenging combination of curved and straight segments. Begin drawing anywhere you like on the shape's edge, but the first time you try it, start at a corner that connects two straight segments. It will be easier to connect the last segment with your first point to finish the shape. You can experiment with this shape from other places on the template. Some starting points make it easier to maintain accuracy and close the shape.

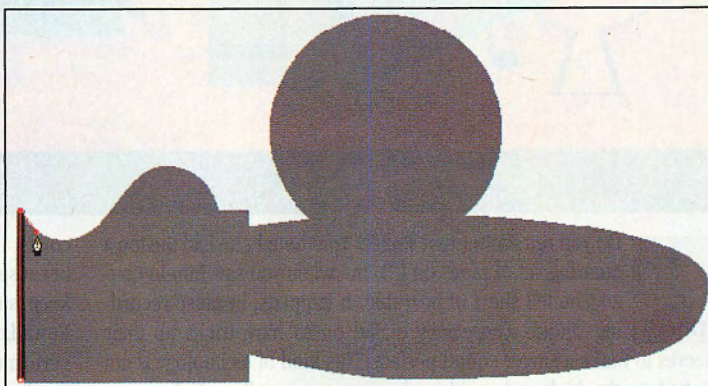
As you follow the shape, you'll make abrupt corner transitions between curves and straight segments. To turn a corner and begin a smooth curve after drawing a straight line, hold down your Option key and click-drag a handle directly from the anchor point where you're starting the curve. You'll also do this when you draw a curve and then change direction for another curve.

To go from drawing a curve to drawing a straight segment, hold down the Option key while you click and release—don't drag out a handle. The anchor point you clicked will lose one of its handles, and you can place the next anchor point and create the straight segment.

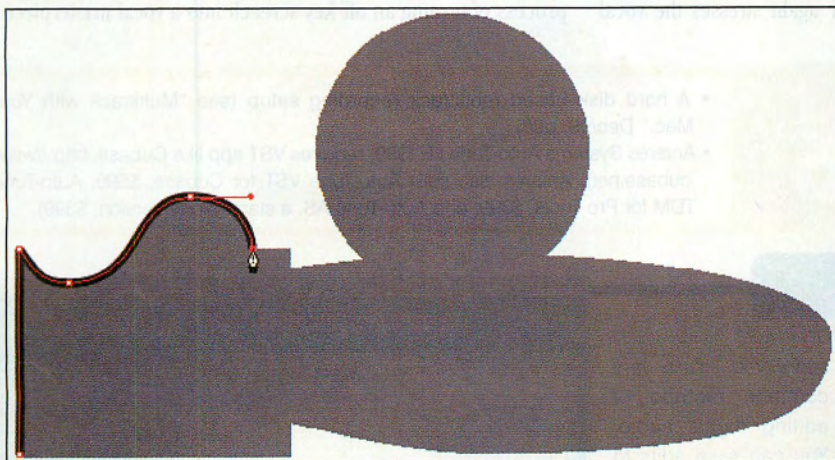
To complete and close the shape, just click the anchor point you started with.



**A CORNER JOINT** between two straight segments is the easiest place to start and end a drawing.



**OPTION-CLICK AND DRAG OUT A CURVE HANDLE** to change direction and start a curve off the end of a straight segment.

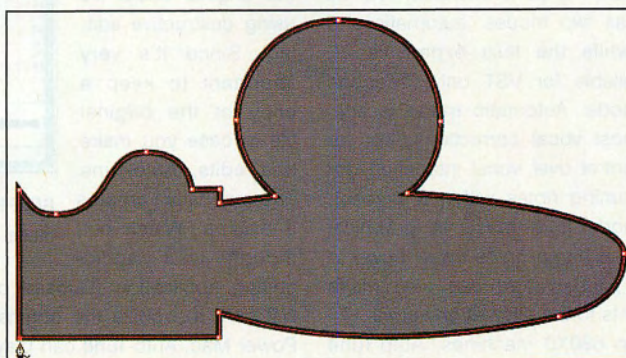


**OPTION-CLICK AND RELEASE** to lose the leading curve handle, change direction, and draw a straight segment off the end of a curve.

## Curve-Drawing Tip

**W**hen dragging out handles, use the one-third rule: Imagine the entire distance of the finished curve as though it were laid out flat, and drag its handle to the equivalent of one-third of that length. This rule of thumb usually works.

Elyse Chapman (elyse@compuserve.com) is a graphic designer, publishing industry consultant, and Quark Authorized Trainer. She has 25 years of experience in the publishing industry and is a managing sysop on CompuServe's Publishing Forums.



**CLICK YOUR STARTING POINT** to close the shape.





# how to

## Use Your Mac to Sing on Key

by Andrew Tokuda

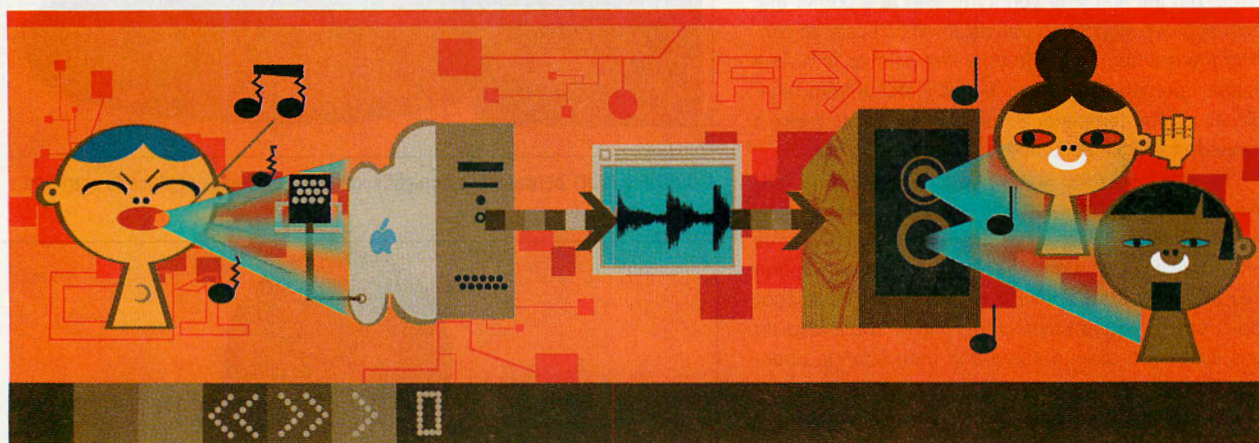


ILLUSTRATION BY CLAUDIA NEWELL



**FIND DEMOS**  
OF Auto-Tune  
VST 1.21 and  
Cubase VST 4.0  
on  
The Disc.



**TRICKY**

Do you remember that singer? You thought he had the most amazing set of pipes on CD, but when you saw him in concert he fell short of bearable. It happens, because recording studios (especially digital ones) have tricks up their sleeves to make a singer sound perfect. This kind of technology is not limited to the high-end, paid-by-the-minute recording studios anymore. Believe it or not, you can do this on your Mac just like the pros.

The vocalist has the toughest job in any recording situation because singing the lyrics over and over again stresses the vocal

cords. In the past, it was important for the vocalist to sing in tune because what was laid to tape was final. This required the vocalist to keep singing his part until the producer was happy with a take. Nowadays, it's still important to put power and emotion into a performance, but vocal intonation can take a cozy back seat thanks to programs like Antares Systems' Auto-Tune (<http://www.antarestech.com>). With a little bit of mouse-pushin' savvy, you can doctor up and fix an off-pitch vocal take. We'll walk you through the process of turning an off-key screech into a vocal masterpiece.

## WHAT YOU WILL NEED

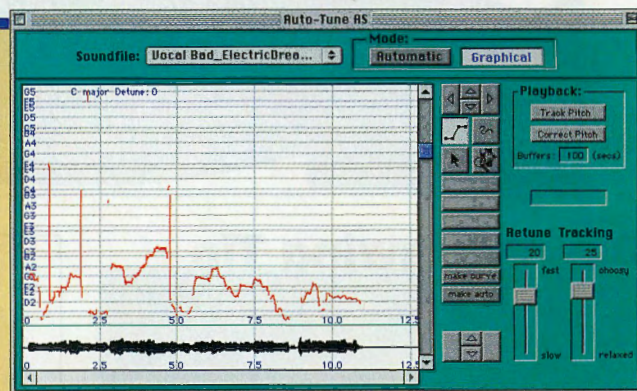
- A hard disk-based multitrack recording setup (see "Multitrack with Your Mac," Dec/99, p98).
- Antares Systems Auto-Tune LE (\$99, requires VST app like Cubase, <http://www.cubase.net>). Antares also sells Auto-Tune VST for Cubase, \$599; Auto-Tune TDM for Pro Tools, \$399; and Auto-Tune AS, a stand-alone version, \$399).

## Inside Auto-Tune

**A**uto-Tune is available in two forms: as a plug-in for a VST (Steinberg)– or TDM (Digidesign)–based audio application, or as a stand-alone program. Both forms use the same interface. The full Auto-Tune has two modes, automatic and graphical, while the less expensive LE version (available for VST only) supports automatic mode. Automatic mode is adequate for most vocal corrections, but for hands-on control over vocal intonation (for example, retuning notes within a phrase), graphical mode is a must. In graphical mode, you can bump notes up or down to the correct pitches. You can also make adjustments to the pitch at any point.

On 680X0 machines, Auto-Tune is a "destructive editing" plug-in. Don't let that term

scare you—it's a very common method of editing digital audio. You can save edits to the original audio file using destructive editing. Since it's very important to keep a copy of the original file in case you make bad edits, Auto-Tune automatically creates a backup. Watch out, though—your audio-editing application (Cubase or ProTools) will only recognize the original file. On a Power Mac, Auto-Tune can play back edits in real time, letting you hear the effect of the plug-in without actually altering the sound



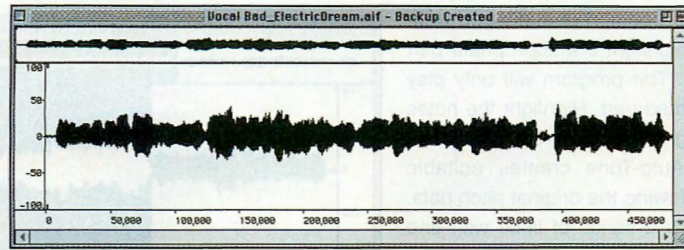
**GRAPHICAL MODE** lets you tweak the pitch much more than automatic mode. The red lines represent the pitch of a vocal on a timeline.

file. Regardless of your machine, it's also a good idea to break the vocal audio file into several segments, as it's much easier to work with short phrases than with a single four-minute song.



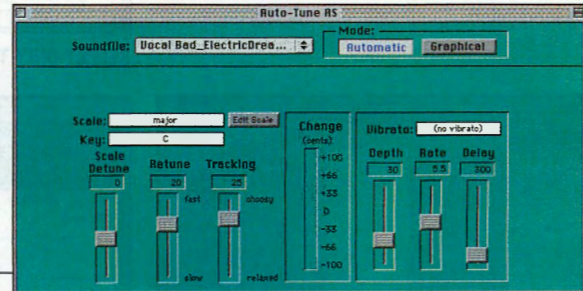
## 1 Bring In the Audio

We'll show you how to use the stand-alone version of AutoTune. (If you're using one of the plug-in versions, the interface will be identical.) Before you do anything with Auto-Tune, make a back-up copy of the vocal audio file. Launch AudioStream (the front-end application for the Auto-Tune plug-in). Open a mono AIFF file by selecting Open from the File menu. You will see a waveform representation of the audio file. Select Auto-Tune AS from the Plugins menu, and click the Automatic button to bring up the automatic mode window. Set the Soundfile pop-up menu to the name of your audio file.



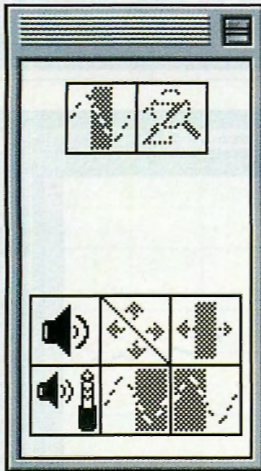
THIS JAGGED LINE is a graphical representation of the vocal (called a waveform).

CONTROLS IN THE AUTOMATIC MODE WINDOW allow you to fix slightly off-key vocals.



## 2 Tune Up

You should always start in automatic mode—if the vocal track is not badly out of tune, this mode will handle it nicely. A little bit of music knowledge will help here, as you'll need to select the scale and key. Suppose the song is in C minor. You can scroll through the list of scales by clicking the box next to Scale. The default key is C. The song you are working on should be tuned to concert pitch A or A-440 (a properly tuned piano is one that's tuned to A-440). Since Auto-Tune is always tuned to A-440, a tuning



mismatch between the song and the program will make things very complicated. After selecting the scale and key, we can listen to the corrected sound by clicking the Play Plug-In button (the speaker-and-plug icon) on a PowerPC. On a 680X0 machine, select Edit With Plugins from the File menu (to revert to the unprocessed sound, use the Undo command).

If the vocal is now on key, you're done. You can listen to your track with the musical accompaniment in your audio editing application to make sure that it's in tune.

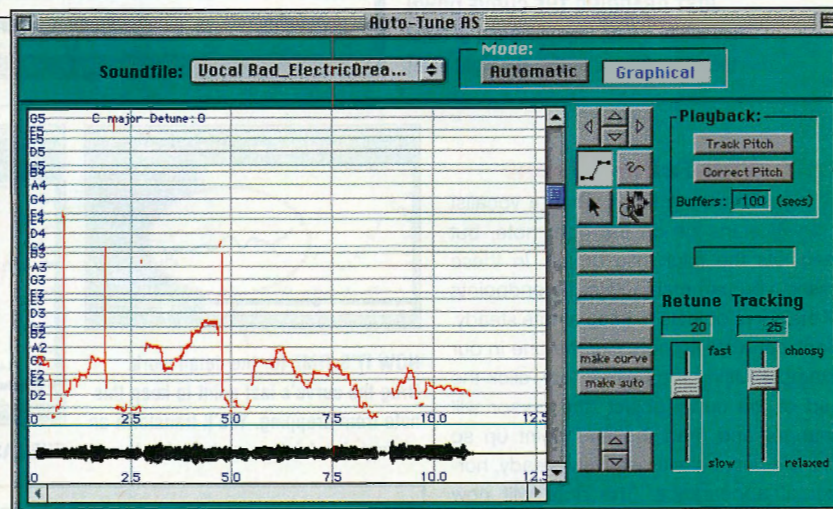
THE PLAYBACK INTERFACE is very straightforward—click the Play Plug-In button (the speaker with plug) to hear the result of the pitch change.

Sometimes, though, Auto-Tune bumps notes to the wrong pitch. Auto-Tune works by continuously tracking the pitch in the audio file and *centering* the pitches to the closest notes specified in the scale and key. For instance, if you sing an E-flat in the key of C minor just a hair off, Auto-Tune bumps that note as close to "concert pitch E-flat" as possible. This works fine if the note is only slightly out of tune. However, if the note is off by more than a semitone (a semitone is the tonal distance between notes corresponding to two adjacent keys on a piano), Auto-Tune cheerfully changes the vocal to the wrong note! If this happens, you'll need to do a bit of surgery. This is where graphical mode comes in handy. In this mode, you can bump the off note up or down to the correct pitch.

## 3 Turn Off the AutoPilot

You can access the graphical mode by clicking the button labeled Graphical. Click the Track Pitch button in the Playback box. Click the Speaker icon, and Auto-Tune detects the notes the singer is producing. You then see some squiggly red lines in the graph window. These indicate the detected pitch along a timeline.

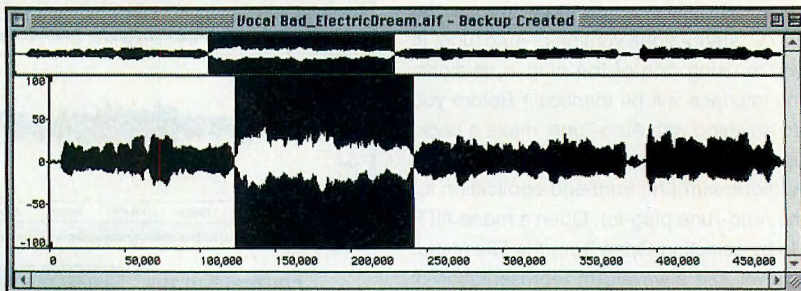
IF YOUR SINGER COULDN'T even stay close to the correct notes, you'll have to do repairs in graphical mode.



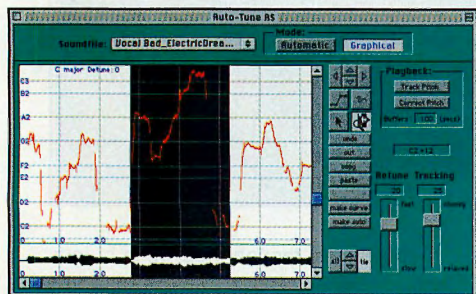


## 4 Scalpel, Please

To select a portion of audio you want to edit, highlight the appropriate part of the waveform. The program will only play back the highlighted part. Highlight the notes to correct in the graph window. Click the Make Curve button. Auto-Tune creates editable curve objects following the original pitch data. These objects are a series of lines with end points you can move up or down to the desired pitch.

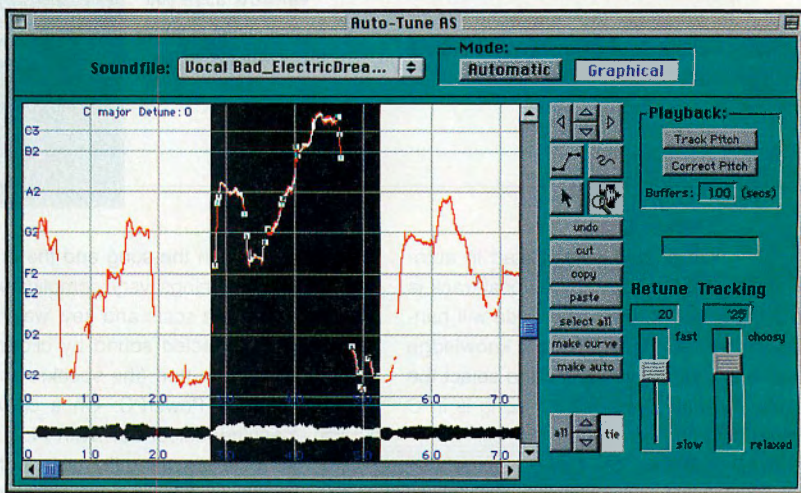


SELECT ONLY THE PORTION of the audio track you want to work with.



NOW HIGHLIGHT THE NOTES you want to fix.

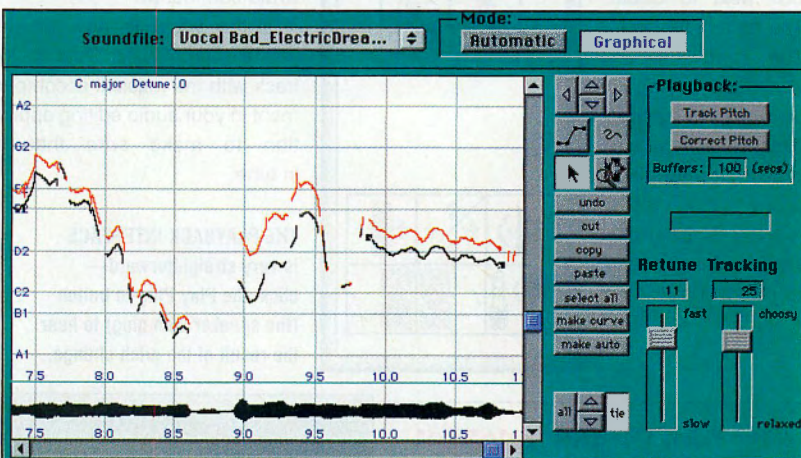
ONCE YOU'VE  
clicked Make Curve,  
the notes become  
editable objects.



## 5 Ow! My Ears!

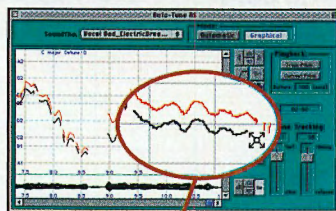
The notes in our example are almost a whole tone too sharp—this is a really bad singer. Select a curve object by clicking it with the pointer tool, and drag it down to the appropriate pitch. You should see black lines indicating the corrected pitch below the red lines showing the original pitch. Keep playing with the placement of the objects and listening to the plug-in playback until you get the song right.

JUST DRAGGING THE CURVE DOWN  
has made a vast improvement; at least  
the singer's now hitting the right note!

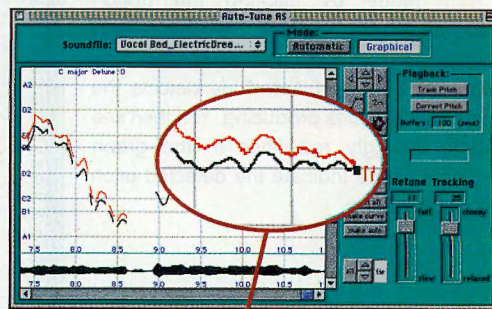


## 6 The Falling Vocal

There are times when a vocalist starts off on the right note, but then lets the pitch rise or fall. In these cases, you can manipulate the endpoints of the curve objects to keep a note steady. Consider a falling note like the one in our example. Using the pointer tool, click the end of the curve object (the cursor will change) and drag the end point up so that the curve has a relatively steady, horizontal appearance. The note will now sustain an even pitch. Congratulations—the vocal track is now on key!



NOW IT'S TIME for the detail work.  
Drag the curve's last point to keep this  
note from dropping. You'll transform an  
off-key shriek into a sustained note.

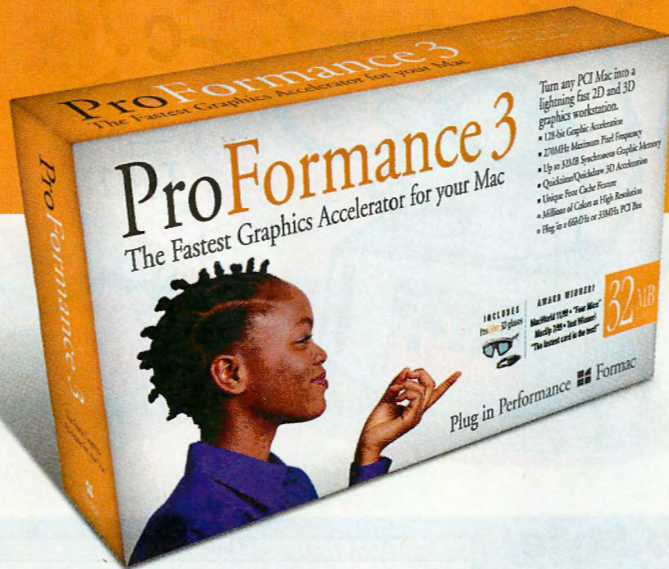


THE LAST NOTE HOLDS STEADY instead of falling off.

Andrew recently took his songwriting to another level by integrating digital audio and MIDI using his Mac. He performs under the pseudonym Digital Droo.



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## how to

## Use Word's Style Sheets

by Maria Langer



Everyone knows how to format text. Select the text, then select the formatting commands—simple. Anyone can do it—or overdo it.

However, manually applying formats to characters or paragraphs isn't always the best way to handle a long document. Sure, the text looks the way you want it to, but what if you change your mind? What if your boss, editor, or a higher authority changes his or her mind? Then you have to go back through the document, find the formatting you applied, and change it to the preferred formatting. Miss a few changes and consistency goes down the drain—what a nightmare.

Fortunately, there's a better way: styles. Word's style feature enables you to define character or paragraph styles. You name the style with a name you like and can remember. You specify what formatting makes up the style. Then

you save the style and apply it as desired throughout your document.

Wait, you say. That sounds like more work than doing it manually.

Defining styles may take a bit of extra effort, but it pays off when you apply them. For example, say you want to format text with the following options: bold, italic, 12-point Helvetica, centered, and 8 points before each paragraph. You would have to go through six steps for each text selection you format.

But if you define a style for this formatting, you can apply all six options in a single step. Best of all, if you change the style's definition—say you really want bold, italic, 14-point Times with 8 points before and 4 points after paragraphs—in one step you can change all text in that style. Now *that's* a real time-saver.

Follow along as we show you how to define, apply, and modify styles in Microsoft Word 98. Once you've used them, we're sure you'll agree that styles are the best way to format your documents.

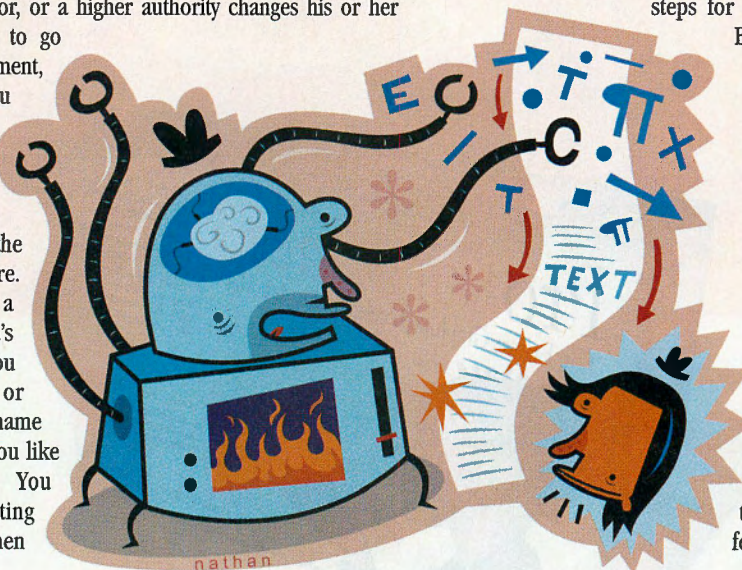
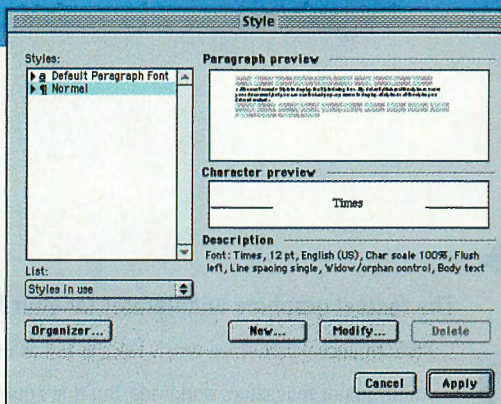


ILLUSTRATION BY NATHAN JUREVICH

## Defining the Style

## 1 Open the Style Dialog Box

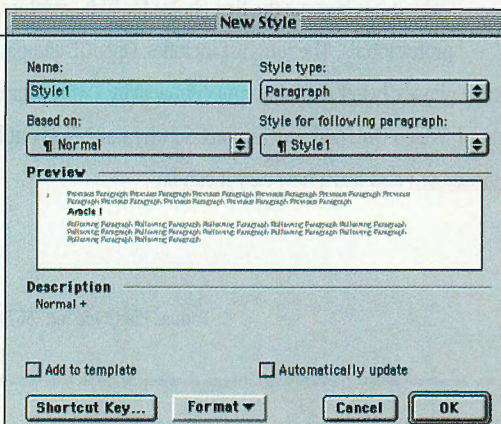
There are lots of ways to define styles in Word. Rather than tell you all of them, we'll concentrate on the most flexible method: the New Style dialog box. Choose Style from the Format menu to display the Style dialog box. By default, it lists only the styles in use in your document, but you can select the List pop-up menu to display all styles (you'll find tons of predefined styles) or just the ones you've defined.



THE STYLE DIALOG BOX lists all the styles in the document by default.

## 2 Make a New Style

Click the New button to display the New Style dialog box.



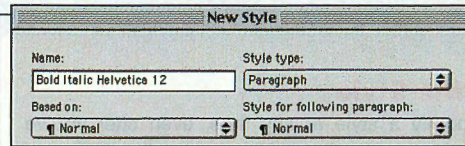
IN THE NEW STYLE DIALOG BOX, you can define a new text style.



### 3 Specify Your Style

Enter a name for the new style in the Name entry box. Then choose a type from the Style Type pop-up menu. Your options are Paragraph and Character. Paragraph styles affect the entirety of the paragraphs you apply them to, and can include any sort of formatting. Character styles only apply to the text that you've selected, and cannot involve formats that must apply to entire paragraphs such as line spacing and alignment.

To base your style on an existing one, choose the existing style's name from the Based On pop-up menu. If you don't know what to base the style on, choose Normal (for a paragraph style) or

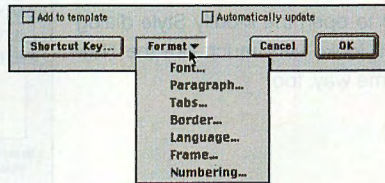


ENTER BASIC INFORMATION for the style you are defining.

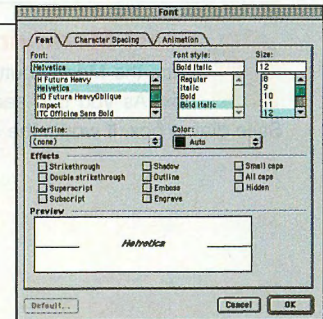
Default Paragraph Font (for a character style). For a paragraph style, you can specify a separate style that automatically applies to the following paragraph when you press Return while typing. To do this, choose a style from the Style For Following Paragraph pop-up menu. Having the style automatically change at a paragraph boundary can be very useful if you want text boxes that look dramatically different from the rest of the text.

### 4 Choose a Type of Formatting

Use the Format button menu in the New Style dialog box to select a type of formatting to apply. Each option displays a specific formatting dialog box—Font, Paragraph, Tabs, and so forth. In the formatting dialog box, set options for the style, then click OK.



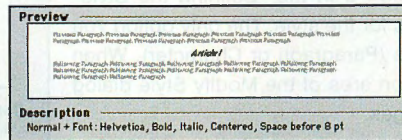
CHOOSE A TYPE OF FORMATTING to display the appropriate dialog box.



SET OPTIONS in the formatting dialog box that appears.

### 5 Finish Formatting

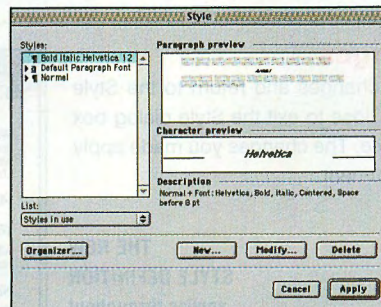
Repeat step 4 until you have set all the desired formatting options for the style. When you're finished, the Description area of the New Style dialog box should indicate all the options you defined.



YOUR DEFINITION appears in the Description area of the New Style dialog box.

### 6 Save the Style

Click OK to save your changes and return to the Style dialog box. Your style appears in the Styles list. You can repeat steps 2 through 6 to define more styles, or click Close to exit the Style dialog box without applying the new style.

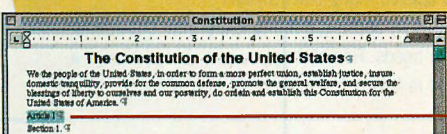


YOUR NEW STYLE appears in the Style dialog box.

## Applying the Style

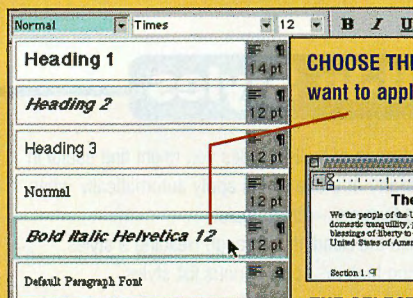
There are lots of ways to *apply* styles in Word, too. Here's the quickest, easiest one. Select the text to which you want to apply the style. To apply a character style, you must select the appropriate text. To apply a paragraph style, simply position the blinking insertion point in the desired paragraph.

1 To apply the style to lots of paragraphs, select them all.

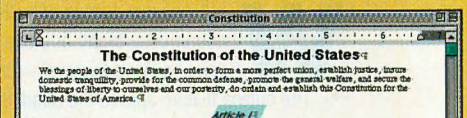


SELECT THE TEXT that you want to style.

2 Choose the name of the style from the Style menu on the Formatting toolbar. This applies the style to the selected text.



CHOOSE THE STYLE you want to apply.



THE SELECTED TEXT appears in that style.

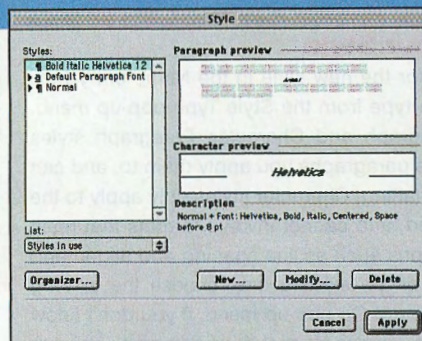


## Modifying the Style

### 1 Select the Style

You can modify a style at any time, even after you've applied it throughout your document. Modifying a style works in a cool way: Once you change the style's definition, text formatted in that style changes throughout the document to match the new definition.

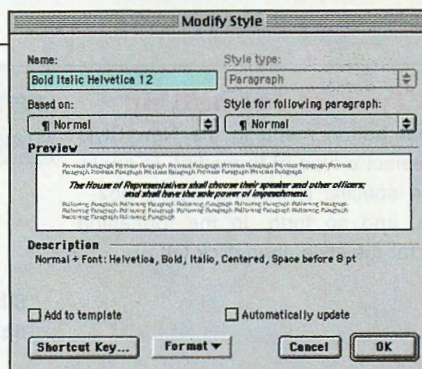
Again, there are multiple ways to modify a style. Here's the most powerful one: Choose Style from the Format menu to open the Style dialog box. Select the name of the style you want to modify.



OPEN THE STYLE DIALOG BOX and select the style you want to modify.

### 2 Start Modifying

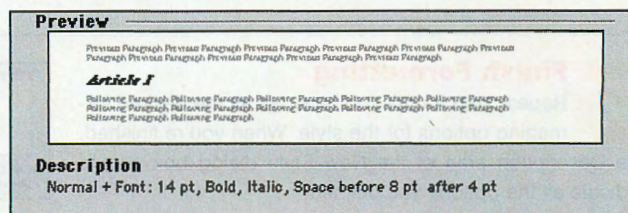
Click the Modify button to open the Modify Style dialog box. As you can see, it looks very much like the New Style dialog box. It works the same way, too.



OPEN THE MODIFY STYLE dialog box.

### 3 Just Like Before

Follow steps 3 through 6 in the "Defining the Style" section to set options for the style. The only option you can't change is the style type (Paragraph or Character). When you're finished, the Description area of the Modify Style dialog box should reflect your changes.

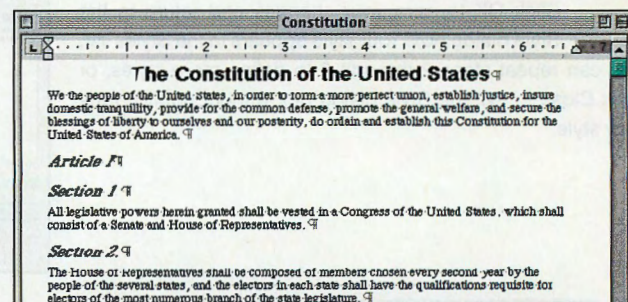


YOUR CHANGES appear in the Modify Style dialog box under Description.

### 4 Save Your Changes

Click OK to save your changes and return to the Style dialog box. Then click Close to exit the Style dialog box without applying the selected style. The changes you made apply immediately throughout the document.

THE NEW STYLE DEFINITION applies throughout the document.



Maria Langer is a freelance writer based in Wickenburg, Arizona. She is the author of several books about Microsoft Word, including *Word 98 for Macintosh: Visual QuickStart Guide* (Peachpit Press, 1998). Visit her on the Web at <http://www.gilesrd.com/mlanger>.

## The Built-In Styles

Word includes dozens of built-in styles you might find useful in documents. Many of these styles apply automatically when you use Word features—for example:

- The outline feature applies the Heading 1 through Heading 9 styles.
- The bullets and numbering features apply various list styles.
- The footnote feature applies the Footnote Reference and Footnote Text

or the Endnote Reference and Endnote Text styles.

- The Web authoring feature applies HTML-related styles.
- The AutoFormat feature applies many other styles.

Check out the built-in styles by applying them to text in your documents. They may meet many of your needs. Remember, you can always change a style's definition so the text is formatted exactly as you wish.



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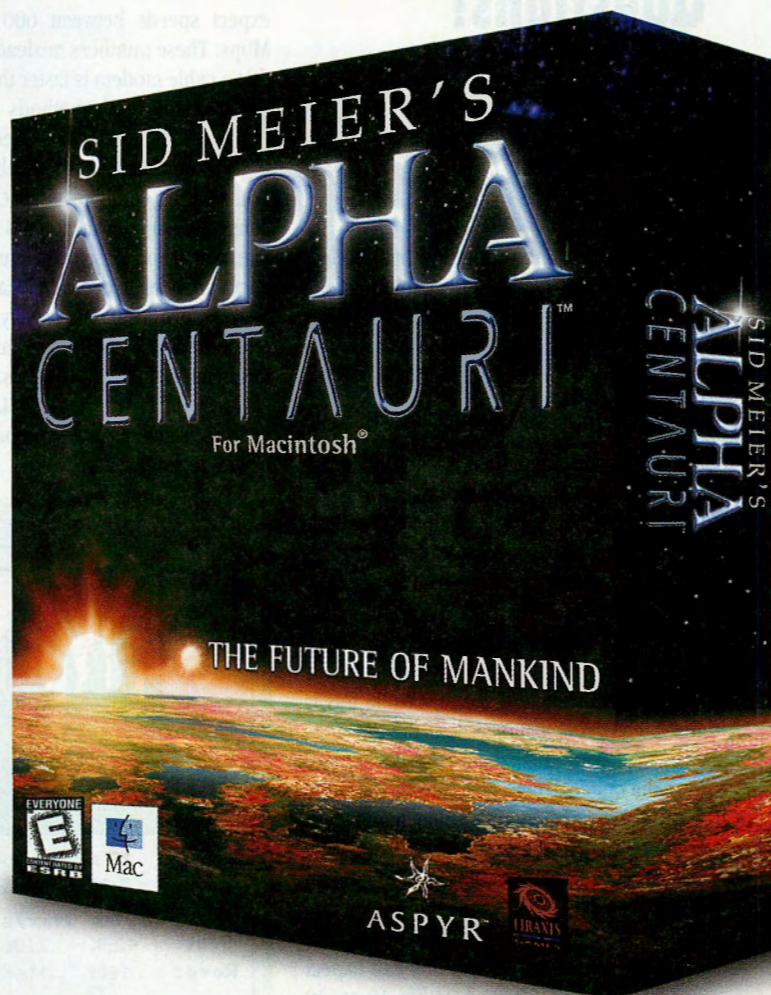
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- PC Gamer

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# ask us

The Buz on sharing printers, high-speed Internet access, and DVDs on TV.

## Questions?

Submit technical questions or helpful tips directly via email ([askus@macaddict.com](mailto:askus@macaddict.com)) or c/o MacAddict, 150 North Hill Dr., Brisbane, CA 94005.

**Q** I have an iMac with a 56-Kbps modem and am considering getting a cable modem. I was wondering how the speed compares and whether there is anything even faster. I've also heard of T1 and DSL, but what's the fastest option?

**A** Bandwidth, my friends—it all comes down to bandwidth. The more bandwidth you have, the more data can pass through and the faster you get what you want. Not too long ago we were cruising the Net at an agonizingly slow 2.4 Kbps. We have now reached the limit of modern modem technology, peaking at a theoretical 56 Kbps (though typical modems never really go quite that fast). While this is absolutely *flying* compared to the 2.4-Kbps days, we are now demanding more and more from the online experience.

The two most popular megabandwidth connection methods today are cable modem and DSL or ADSL. Cable modem speed can vary widely, depending on the system, the cable network architecture, and the traffic load. On average, one can expect 500 Kbps to 2.5 Mbps, roughly 10 to 20 times faster than your 56-Kbps modem. DSL (digital subscriber line) and ADSL (asymmetric digital subscriber line) technology both convert existing telephone lines into high-speed data-transfer lines. This relatively new technology can also vary its speed depending on the network infrastructure

and the hardware. You can reasonably expect speeds between 600 Kbps and 1 Mbps. These numbers misleadingly indicate that a cable modem is faster than a DSL line, but in reality both methods end up functioning at about the same speed.

The next step above a cable modem or DSL solution combines a special phone line connection and hardware into a T1 line. This line, which you lease from your phone company, provides a dedicated data connection between two locations, usually connecting at one end to an ISP. A T1 can handle sustained throughput of about 1.5 Mbps. This speed is similar to that of cable and DSL, and is beginning to show its age compared with the newest technologies.

Lots of up-and-coming connection methods promise extremely fast data connectivity. Some of the more prevalent ones are T3, which can deliver 45 Mbps, OC3 (Optical Carrier) at 155 Mbps, and OC-48, which claims an astounding 2,488 Mbps! If you want to monitor your network connection to find



**CHECK YOUR SPEED** in Netscape by looking at your transfer rate in the lower left corner.

out exactly what kind of throughput you are getting, try Sustainable Network's IPNet-Monitor (<http://www.sustworks.com>) for Ethernet connections or Hutson Digital's Remote Access Window (RAW) Bar (<http://www.hutsondigital.com>) for modem connections. Whatever the future may hold as far as Internet connectivity is concerned, you can count on continued speed improvements.

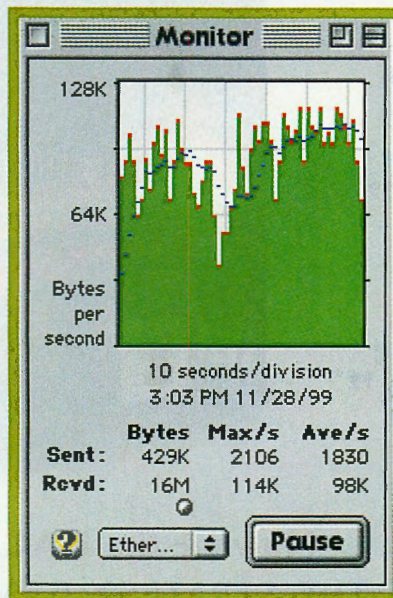
**Q** My computer has lots of old stuff on it that I would like to throw away. But I can't get rid of these items—when I try to empty the Trash, it says they are locked. How can I delete these files?

**A** Locked files can't be modified or deleted. You lock files by clicking the Locked radio button in the file's Get Info dialog box (select the file in the Finder and then go to Get Info under the File menu). Unlock files by deselecting the same radio button. The Finder will not allow deletion of locked files. To bypass this built-in security, hold down the Option key while selecting Empty Trash from the Special menu.

**Q** My old Power Macintosh 8100 used to start up with the resolution set to 1024 by 768, but my brand-new G3 starts up at 640 by 480 and then switches to 1024 by 768 about halfway through the startup process. Is there something wrong with my new computer?



Find IPNet Monitor 2.3.2, Web Album Wizard 1.0.2, EpsonShare 1.3, RAW Bar 3.0, and BTV 3.2.4 on The Disc.



**A CABLE MODEM CAN PROVIDE A HUGE SPEED BOOST**, as you see in this image (from Sustainable Network's IPNetMonitor) of a cable modem connection.

## Consider Us Plucked

In the December issue, we referred to a fabulous freeware utility by Kevin Aitken called System Picker. This handy utility lets you switch between more than one active System Folder on the same drive. Sorry, y'all, but we forgot to tell you where to get it! It is only available on Apple's special developer FTP site. The address of the FTP directory that holds it is <ftp://ftp.apple.com/devworld/Utilities>.



**A** No, there is nothing wrong with your computer. The switch is due to Apple's new method for handling video drivers. On newer computers, Apple has placed the resolution information in a preference file stored on the hard drive; therefore the Mac sets the resolution as the system software is loading. Older computers store the resolution setting in the PRAM (parameter RAM), which loads as soon as you turn the computer on. As long as the Macintosh displays your preferred resolution when the Finder finishes loading everything, there's no problem.

**Q** I take a lot of digital pictures and would like to put them on a Web page. On this page I want a gallery of thumbnails people can click to bring up the full-size picture. Doing this manually is extremely time-consuming—is there a way to simplify the process?

**A** One of the most popular benefits of having a digital camera is the ability to share pictures via email or on a Web page. But you're right—creating thumbnail pages with links takes time and is mind-numbingly repetitious. Is there an easier way? Absolutely—what you need is some helpful software created for just this purpose. Black Magik's Web Album Wizard (\$19.95 shareware, <http://www.blackmagik.com>

[/albumwiz.html](http://albumwiz.html)) or Stephen Baber's Quicknailer (\$18 shareware, <http://www.amug.org/~sbaber>) can take care of this chore for you.

**Q** Is it possible to output DVDs from my 350MHz blue-and-white G3 to my 61-inch TV? If so, what hardware or software do I need?

**A** Of course you can view DVDs playing on your shiny new G3 with a TV—all you need is a scan converter. This device turns the RGB output from your computer into a TV-ready NTSC signal. With one of these handy devices, you can view your Mac's output on any video equipment that accepts either standard RCA video input or S-video signals.

Though people most commonly use this method for presentations (such as Steve

Jobs's Macworld Expo keynotes), it will work just fine for playing DVDs on your TV. A scan converter can come in the form of an external box or an internal PCI card. Focus Enhancements (800-699-3972, <http://www.focusinfo.com>) offers both solutions in its TView Gold (a box) and TView Gold PCI card. If you own an older iMac that does not have a video-out port, Focus also sells a USB version called iTView Gold.

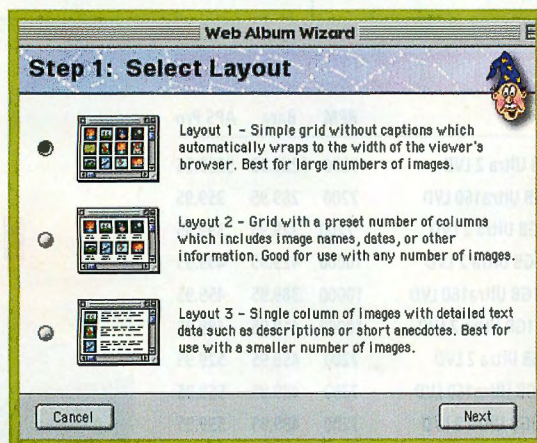
**Q** Can I share my printer with the other computers on my home Ethernet network?

**A** The answer to this question lies entirely in what brand, type, and model of printer you are using. Some—most laser printers, for example—are already Ethernet enabled, in which case all you need is a patch cable. The majority of laser printers also use the LaserWriter 8 driver, already installed on most Macs. However, not all laser printers are network-ready out of the box. Some require a separately purchased network card.

If your printer does not support Ethernet at all (most ink-jet printers don't), two other options might work. In one scenario, you use a Mac as a host or bridge to the printer. In the other, you need some extra network hardware to connect your printer. If you have an Epson printer, Epsonshare (<http://www.ses.fr/epsonshare>) might be just the ticket. This excellent piece of software enables one of your Macs to host the printer for the rest of the network. If your printer is a Stylewriter, you already have the software to make it accessible to the network. Simply click the Setup button in the Chooser and select Share This Printer.

If your printer is LocalTalk capable (some older Hewlett-Packard printers are), you can use LocalTalk connectors such as the AsanteTalk device (<http://www.asante.com>) to build a separate printer network through your Mac's serial ports. Of course, LocalTalk is much slower than Ethernet, and every Mac you connect will need a serial port. For more information, check out the 3 Macs & a Printer Web site (<http://www.threemacs.com>), where you can find everything you could possibly want to know about printers and networks.

Buz Zoller is a technology support specialist for a school district in Texas, and a contributing editor at *MacAddict*. Challenge his knowledge by sending your questions to [askus@macaddict.com](mailto:askus@macaddict.com)



**CREATING A WEB PAGE WITH THUMBNAILS** has never been easier than it is with Web Album Wizard.

## Capture Connections

In the January *Ask Us* column, we recommended a free FireWire-compatible DV capture application called HackTV. HackTV is now available only via Apple's QuickTime developer Web site (<http://www.apple.com/quicktime/developers/tools.html>). Speaking of wonderful and inexpensive video capture software, Ben Bird's BTV application gets our wholehearted support. For \$15, you get software that captures video to your Mac via any video input card, TV card, built-in video hardware, USB, or FireWire source. Way cool!



**GET STARTED USING DIGITAL VIDEO** with BTV, an inexpensive yet powerful video capture tool.






**Unbelievable  
Price  
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Pro 2 Configuration

## APS USB CD-RW 4x4x24

- CD-RW drive with convenient USB interface for hot-swapping, long chains
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 This CD-ReWritable drive hooks up in a flash to your USB-compatible PC or Mac. And since USB is hot-swappable, you can share the USB CD-RW with other compatible systems in no time flat. There has never been a USB CD-RW drive like this. Call and order today.


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## APS CD-RW 8x4x24 SCSI

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- Burn a CD in just nine minutes, rewrite in 18

 The newest member of the APS CD-RW family boasts blazing speed and great value. The 8x4x24 mechanism comes from Yamaha, an industry leader in CD performance and reliability. And in the new APS PROII enclosure, this drive is protected from failed burns and overheating.

## APS CD-RW 12x4x32 SCSI

**\$369.95**

## APS DVD-RAM

- Rewritable DVD discs with 5.2GB of storage for backup, archiving, even digital video storage
- Also reads virtually any CD at up to 20X speed

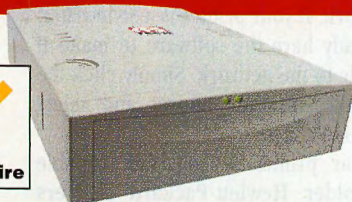
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APS 20GB Firewire Hard Drive	469.95
APS 37GB Firewire Hard Drive	649.95
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### APS Ultra 2 Wide/Ultra 160 LVD SCSI Drives

Model	RPM	Bare	APS Pro
APS I 9GB Ultra 2 LVD	7200	\$269.95	\$339.95
APS Q 9GB Ultra160 LVD	7200	289.95	359.95
APS ST 9GB Ultra 2 LVD	7200	329.95	399.95
APS I 9.1GB Ultra 2 LVD	10000	429.95	499.95
APS Q 9.1GB Ultra160 LVD	10000	389.95	459.95
APS ST 9.1GB Ultra 2 LVD	10000	419.95	489.95
APS I 18GB Ultra 2 LVD	7200	459.95	529.95
APS Q 18GB Ultra160 LVD	7200	489.95	559.95
APS ST 18GB Ultra 2 LVD	7200	489.95	559.95
APS I 18GB Ultra 2 LVD	10000	689.95	759.95
APS Q 18GB Ultra160 LVD	10000	649.95	719.95
APS ST 18GB Ultra 2 LVD	10000	669.95	739.95
APS I 36GB Ultra 2 LVD	7200	899.95	969.95
APS Q 36GB Ultra160 LVD	7200	899.95	969.95
APS ST 36GB Ultra 2 LVD	7200	899.95	969.95
APS Q 36GB Ultra160m LVD	10000	1,099.95	1,169.95
APS ST 36GB Ultra 2 LVD	10000	1,099.95	1,169.95
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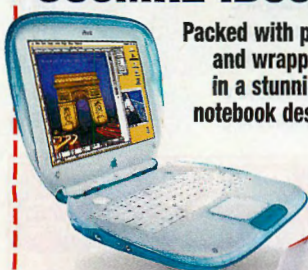
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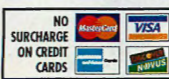
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# Power Mac G4

## Computer in History

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G4/350MHz	10.0GB Ultra ATA-66	64MB/1.5GB	1.0MB at 175MHz	DVD-ROM (read only)	56K Internal	#114855	<b>\$1594.98</b>	\$56
G4/400MHz	20.0GB Ultra ATA-66	128MB/1.5GB	1.0MB at 200MHz	DVD-ROM (read only)	56K Internal	#114837	<b>\$2494.98</b>	\$88
G4/450MHz	27.0GB Ultra ATA-66	256MB/1.5GB	1.0MB at 225MHz	DVD-RAM (read/write)	-	#112669	<b>\$3494.98</b>	\$123

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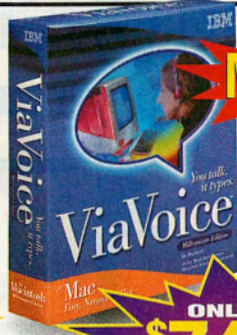
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Strawberry DV	400MHz	10.0GB	64MB	DVD	2-ports	2-ports	Yes	Yes	#112620	\$1294.98	\$46
Lime DV	400MHz	10.0GB	64MB	DVD	2-ports	2-ports	Yes	Yes	#112621	\$1294.98	\$46
Tangerine DV	400MHz	10.0GB	64MB	DVD	2-ports	2-ports	Yes	Yes	#112618	\$1294.98	\$46
Grape DV	400MHz	10.0GB	64MB	DVD	2-ports	2-ports	Yes	Yes	#112619	\$1294.98	\$46
Blueberry DV	400MHz	10.0GB	64MB	DVD	2-ports	2-ports	Yes	Yes	#112622	\$1294.98	\$46
Special Ed. DV	400MHz	13.0GB	128MB	DVD	2-ports	2-ports	Yes	Yes	#112624	\$1494.98	\$53

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- Two USB Ports
- 2 Firewire Ports
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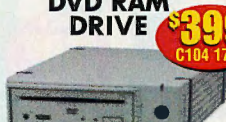
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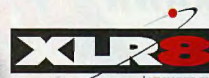
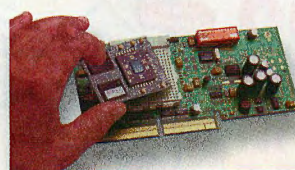
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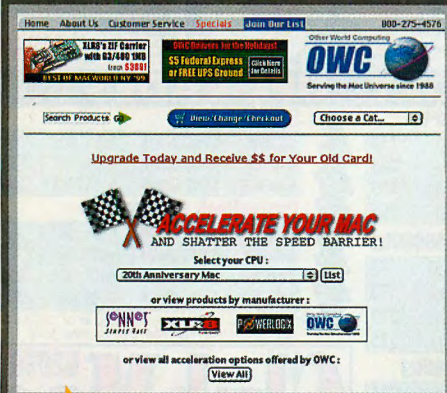
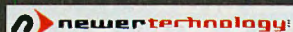
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Apple Rom 24X CD-Rom SCSI	\$79	\$129
Apple Rom 12X CD-Rom SCSI	\$39	\$89
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Call for PowerBook 190/500/1400/5300/3400/3500 and Duo Series Memory



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### DIMM 168 PIN Memory



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16 MEGABYTE	<b>\$35</b>
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- 512K backside level 2 cache
- 66MHz System bus
- 32MB of SDRAM; supports to 160MB RAM
- 3.2GB IDE hard disk drive
- Built-in 24X CD-ROM drive

### Connectivity.

- One 12-Mbps Universal Serial Bus (USB) port
- Built-in 10/100BASE-T Ethernet
- Built-in 56K modem

### Great graphics and video features.

- ATI RAGE Mobility graphics controller with 2X AGP for 2D/3D
- 4MB SDRAM video memory
- 12.1-inch (diagonal) built-in TFT SVGA active-matrix display
- 800 x 600 resolution for millions of colors
- Built-in speaker
- 16-bit stereo sound output

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- 13.5" x 11.6" x 1.8"
- 6.6 pounds

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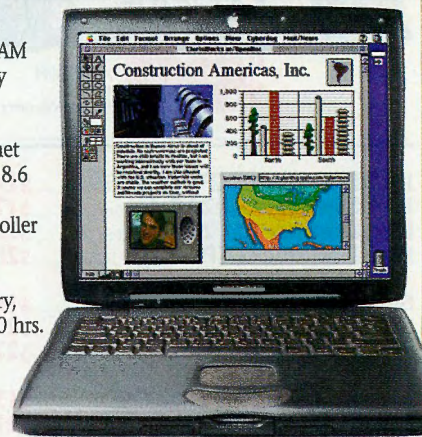
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- ATI RAGE LT Pro video controller
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For those who want a little more, there's the iMac DV Special Edition. It includes all the great features of the iMac DV models and it comes in a unique graphite color.

#### Processor and Memory

- 128MB of SDRAM; two SODIMM slots support up to 512MB

#### Storage

- Internal 13GB Ultra ATA hard disk drive

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# 400MHz

### 400MHz iMac DV Models



Want to play movies or even make some of your own? An iMac DV model is your personal theatre for viewing DVD movies. And just connect your favorite DV camcorder to the FireWire port and use Apple's groundbreaking iMovie software to create your own digital movies.

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- 4X DVD-ROM drive
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- Built-in 10/100 BASE-T ethernet

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## The G4 is here!

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- 1MB backside level 2 cache ■ 2 USB ports
- PowerPC G4 Processor w/ Velocity Engine advanced vector processing technology ■ 2 or 3 Built-in FireWire ports
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Order#	#54391	#54187	#54239
MHz	350MHz	400MHz	450MHz
RAM	64MB	128MB	256MB
Hard Drive	10GB	20GB	27GB
Multimedia	DVD-ROM	DVD-ROM	DVD-RAM
Zip Drive	N/A	Yes	Yes
Modem	56K	56K	N/A
Price	\$1,594	\$2,494	\$3,494



Monitor sold separately.

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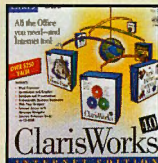
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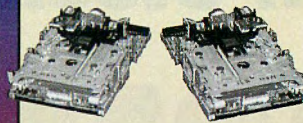
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18.2GB 7200 2MB	IBM318350N	\$420

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9.1GB 7200 2MB	IBM309170W	\$250
18.2GB 7200 2MB	IBM318350W	\$420

**ULTRA-2 SCSI**

9.1GB 7200 2MB	IBM309170U2	\$250
9.1GB 10,000 2MB	IDMV59U2	\$369
18.2GB 7200 2MB	IBM318350U2	\$420
18.2GB 10,000 2MB	IDMV518U2	\$599
36.4GB 10,000 2MB	IDMV36U2	\$999

**IDE & IDE Ultra ATA/66**

9.1GB 7200 2MB	IBM9GX	\$123
13.5GB 2MB 512K	IBM13GX	\$143
20.0GB 5400 2MB	IBM20GX	\$205
20.3GB 5400 2MB	IBM20GX	\$175
25.0GB 5400 2MB	IBM25GX	\$225
27.3GB 7200 2MB	IBM27GX	\$265
34.2GB 7200 2MB	IBM34GX	\$350
37.5GB 5400 2MB	IBM37GX	\$335

## WESTERN DIGITAL

**IDE Ultra ATA/66**

6.4GB 5400 512K	WDAC64AA	\$110
8.4GB 5400 512K	WDAC84AA	\$120
10.2GB 5400 512K	WDAC102AA	\$126
13.0GB 5400 512K	WDAC136AA	\$135
13.6GB 7200 2MB	WDAC136BA	\$155
17.2GB 5400 2MB	WDAC172AA	\$159
20.5GB 5400 2MB	WDAC205AA	\$195
20.5GB 7200 2MB	WDAC205BA	\$245
27.3GB 7200 2MB	WDAC273BA	\$275
30.0GB 5400 2MB	WDAC307AA	\$260

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### Seagate

**ULTRA SCSI**

4.5GB 7200 512K	ST34520N	\$190
9.1GB 7200 512K	ST39140N	\$280

**ULTRA-2 SCSI**

9.1GB 7200 1MB	ST39175LW	\$275
9.1GB 10,000 1MB	ST39103LW	\$395
9.1GB 10,000 4MB	ST39103LW4	\$419
18.2GB 7200 1MB	ST318275LW	\$445
18.2GB 10,000 1MB	ST318275LW	\$645
18.2GB 10,000 4MB	ST318275LW4	\$650
36.4GB 7200 1MB	ST136475LW	\$879
36.4GB 10,000 1MB	ST136403LW	\$1095
50.1GB 7200 1MB	ST150176LW	\$949

**IDE Ultra ATA/66**

4.3GB 5400 256K	ST34314A	\$99
8.4GB 5400 512K	ST38410A	\$118
13.0GB 5400 512K	ST313021A	\$135
17.2GB 5400 512K	ST317221A	\$153
20.4GB 7200 512K	ST320430A	\$189
28.0GB 7200 512K	ST328040A	\$240

### Maxtor

**IDE Ultra ATA/66**

8.7GB 7200 512K	M90871U2	\$115
13.6GB 5400 512K	M91301U3	\$129
13.6GB 5400 2MB	M91369U3	\$143
17.3GB 5400 2MB	M91373U4	\$148
17.4GB 5400 512K	M91741U4	\$140
27.3GB 5400 2MB	M92372U8	\$209
36.5GB 5400 2MB	M93652U8	\$290

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4.3GB 8.45mm	Toshiba MK4313MAT	\$165
6.4GB 8.45mm	Toshiba MK6412MAT	\$212
10.0GB 12.5mm	Toshiba MK1011GAV	\$275
12.1GB 9.5mm	Toshiba MK1214GAV	\$316
18.1GB 12.5mm	Toshiba MK1814GAV	\$361
9.0GB 9mm	IBM DA209000	\$345
15.0GB 12.5mm	IBM DA215000	\$535
18.1GB 12.5mm	IBM DA218000	\$555
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8.4GB Hard Drive (USB8GB)	\$179
13GB Hard Drive (USB13GB)	\$209
17.2GB Hard Drive (USB17GB)	\$219
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Toshiba SCSI DVD RAM drive (SDW1111)	\$429
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Toshiba XM6401B 40X 85ms	\$82
Plextor PX40TS 40X 85ms	\$100
Kenwood UCR415 52X 90ms	\$159
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Plextor PX40TSUW 40X 85ms	\$105
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Mitsumi CRMCFX48X 48X 65ms	\$59
Creative SBCD52 52X 100ms	\$59
Kenwood UCR412 52X 90ms	\$98
Kenwood UCR421 72X 90ms	\$125
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Pioneer 24 X6 Disc Ext. SCSI (DRM6324X)	\$395

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4-8GB	90MB/min	Sony SDT7000AI	\$519
4-8GB	60MB/min	HP C1599AI	\$569
12-24GB	144MB/min	Sony DDS-3 SDT9000AI	\$679
12-24GB	132MB/min	Seagate DDS-3 STD24000N	\$689
12-24GB	120MB/min	HP DDS-3 C1554AI	\$729
20-40GB	288MB/min	Sony DDS-4 SDT10000AI wow!	\$999
35-70GB	360MB/min	Seagate AIT ST2701W	\$1899
48-96GB	60MB/min	Seagate DDS-2 STL49000N	\$2159
72-144GB	120MB/min	HP 6 tape load DDS-3 C568A	\$1999
• <b>EXABYTE 8mm DAT</b> •			
7-14GB	120MB/min	ELIANT820	\$1299
20-40GB	360MB/min	EXB8900	\$2119
70-140GB	60MB/min	EXB110H External	\$2539
• <b>QUANTUM DLT</b> •			
20-40GB	180MB/min	DLT4000	\$1529
35-70GB	600MB/min	DLT7000	\$3979
40-80GB	600MB/min	DLT8000	\$4299

## REMOVABLE MEDIA

Iomega	
100MB Zip Ext SCSI	\$109
2GB Jaz Internal SCSI	\$309
2GB Jaz External SCSI	\$315
1GB Jaz disk 2-4/5-9/10+	\$80/77/77
2GB Jaz disk 2-4/5-9/10+	\$85/80/77
Maxoptix Magneto Optical	
5.2GB SCSI-2 Int. 4MB buffer (T6-5200)	\$1459
Sony Magneto Optical	
5.2GB SCSI-2 Int. 4MB buffer (SMOFSS1)	\$1439

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20 Pack [CDR74P-20]	8x \$59
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20 Pack [CDR74PA-20]	8x \$43
50 Pack [CDR74PA-50]	8x \$75
100 Pack [CDR74PA-100]	8x \$139

**OPTICAL MEDIA**

Size & Description	1-4	5-9	10+
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230MB, 3.5", 512K	\$14	\$10	\$8
640MB, 3.5", 2048K	\$21	\$17	\$15
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1.6Gig, 5.25", 1024K	\$26	\$24	\$22
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4mm DAT 120M	\$14	\$12	\$9
4mm DAT 125M	\$27	\$23	\$20
8mm DAT 112M	\$11	\$10	\$8
8mm DAT 160M	\$16	\$14	\$12
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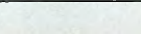
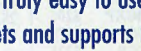
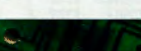
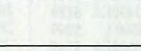
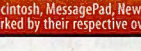
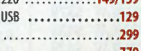
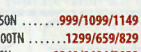
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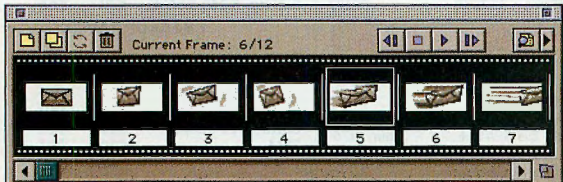
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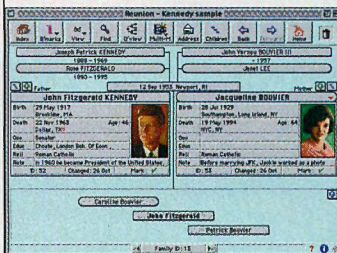
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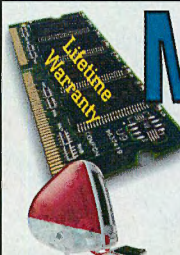
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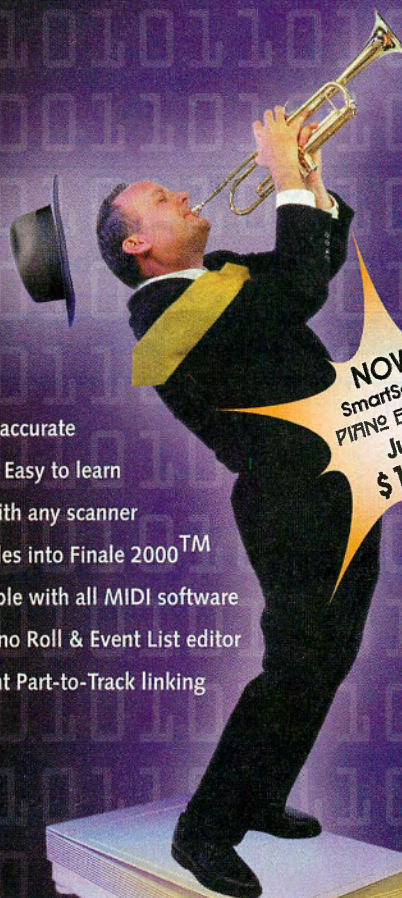
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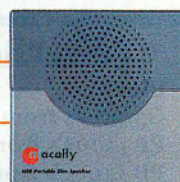
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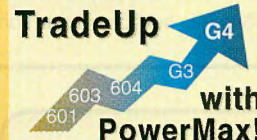
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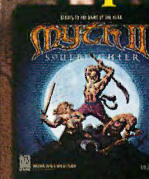
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